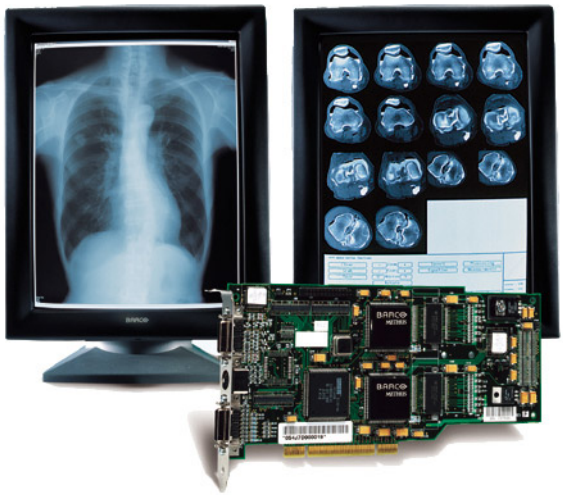
MEDIS
5MP1HM



System Manual

B410046 / 00
July 2003

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INTRODUCTION

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INTRODUCTION

BARCO MeDis® 5MP1H is a total display solution for medical applications. This can be a single-head or multi-head system. MeDis comes with everything you need to set-up a complete viewing system, from video cables to displays.

Contents of the package

Please refer to the packing list on the outside of the MeDis box.

Please contact BARCO if the content of the package does not correspond to the list.

Other relevant documents

- MediCal Pro Installation and User Manual

MeDis installation overview

To install the MeDis system completely, you have to follow these steps:

1 Install the display controller(s) in the PC

2 Install and connect the displays to the PC

3 Install the BarcoMed driver software

4 Install the MediCal software

5 Use MediCal

Important installation considerations

Preparations before installation

1 Make sure all equipment is switched off.

2 In case you use a PCI extension box, please install the box following the guidelines in its Installation or User's guide.

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DISPLAY CONTROLLER INSTALLATION

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BarcoMed 5MP1HM Product Overview

The BarcoMed 5MP1HM Display Controller delivers a quality 2048 x 2560 pixel image with 1024 simultaneous shades of gray for medical imaging applications. The BarcoMed 5MP1HM includes features specifically designed to meet the demands of mammography.

Features of the BarcoMed 5MP1HM

- 2048 x 2560 resolution
- 14 bit input and 10 bit output DAC
- 256 MB Memory
- Accelerated image loading and panning
- Single Head Configuration
- 1024 Simultaneous shades of gray
- Hardware cursor
- Full Speed VGA Emulation
- Single slot PCI card
- Display Properties Control Panel to dynamically change display settings
- Control Panel support for the English (U.S.), Dutch, German, Japanese, Korean, Simplified Chinese and Traditional Chinese languages

Minimum System Requirements

- Half length PCI slot with no obstructions
- PCI 2.1 Compliant System
- NT 4.0 SP4 and above, Windows 2000 SP1 and above, or Windows XP

Supported Resolutions

- 2048x2560 @ 76 Hz (primary)

System Configuration Guidelines

Because of the low power consumption and low heat generation of the 5MP1HM, multiple boards may be installed in adjacent PCI slots or adjacent to other PCI boards. Additionally there should be no need to modify either the PC's power supply and/or cooling system.

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HARDWARE INSTALLATION

Notice: Wear a protective ESD strap during installation or handling of the controller. Electrostatic charges can damage the controller.

Familiarizing Yourself With the 5MP1HM

Prior to installing your 5MP1HM controller(s) in your PC please take a few minutes to familiarize yourself with both the controller and the PCI slots in your computer.

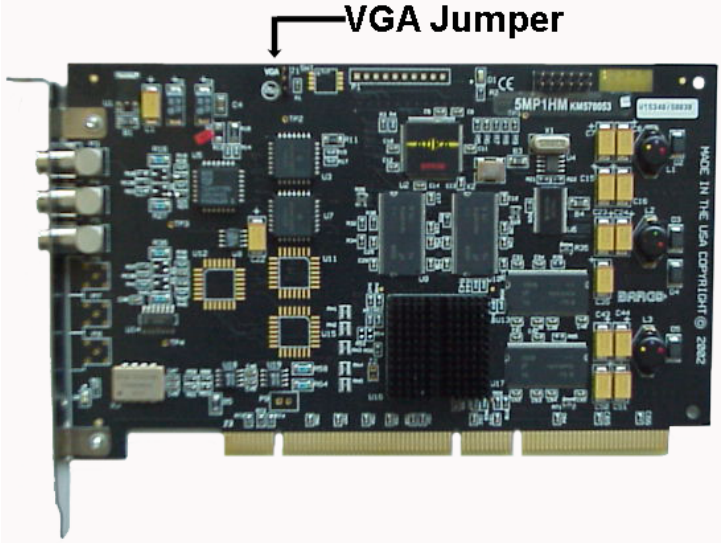

Figure 1: The 5MP1HM Display Controller

Jumper Location

There is one user settable jumper on the BarcoMed 5MP1HM. It is used to enable or disable the VGA capabilities of the controller.

Using the VGA Capabilities of the BarcoMed 5MP1HM

Prior to installing the BarcoMed 5MP1HM, decide if you are going to use its on-board VGA capabilities. If you are, check the setting of the Jumper at J-1 on the display controller. (See VGA Jumper, J-1, Figures 1 and 2) By default, VGA should be enabled, on the top two pins. If you are using the VGA capabilities of the 5MP1HM, you

should now remove any third party VGA controller from your system or disable the integrated VGA controller.

If you decide to use a separate VGA card and monitor as your boot monitor, you must disable the on-board VGA capabilities of the BarcoMed 5MP1HM by moving the jumper to the bottom two pins at J-1.

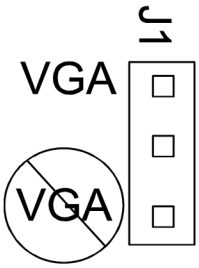

Figure 2: VGA Jumper Enlarged View

NOTE: To use multiple 5MP1HM controllers in a single host with VGA enabled, you need to enable VGA on only ONE of the 5MP1HM controllers and disable VGA on ALL other BarcoMed controllers.

Examples of PCI Slots

The BarcoMed 5MP1HM is a 64–bit PCI controller. To obtain full performance, it needs to be installed in a 64–bit slot. Figure 3 illustrates the types of slots so that you can correctly identify which one to use for the 5MP1HM.

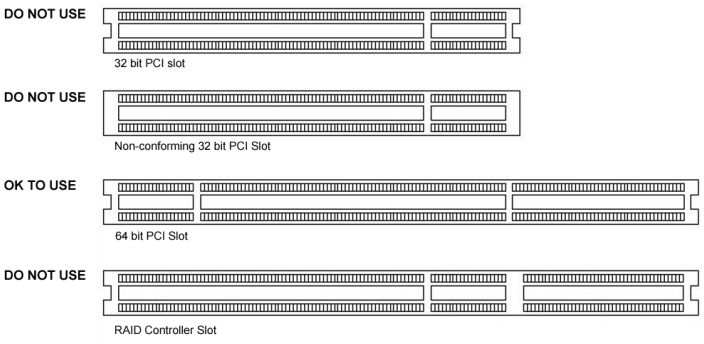

Figure 3: PCI and RAID Controller Slots

Installing the BarcoMed 5MP1HM Display Controller

Install the 5MP1HM into your computer following these steps:

1. Turn off the power to your computer and disconnect the power cord.
2. Remove the chassis cover according to the manufacturer's instructions. Be sure to observe safety warnings.
3. If you have decided to use the on-board VGA capabilities of the 5MP1HM (see Using the VGA Capabilities of the BarcoMed 5MP1HM), you **must now remove** any VGA cards that are currently installed in the computer. You may also need to un-install the drivers for that VGA controller. (Consult the User Guide for your VGA controller for instructions on removing the driver.) If your system has an integrated VGA card you may need to make changes to your systems BIOS settings in order to use the VGA capabilities of your BarcoMed controller. (Consult your PC manufacturer's guides for instructions.)
4. Install the 5MP1HM Display Controller into a free 64–bit PCI slot (see Figure 3 for examples of slots). Be sure that the controller is seated firmly in the slot.
5. Secure the card to the chassis with the PC's I/O panel mounting screw, and replace the chassis cover.
6. Connect the display to the BarcoMed 5MP1HM using the video cable provided with the controller. Each display cable has three BNC connectors on it. The green one is the video, the black one is the horizontal sync, and the white one is the vertical sync. Figure 4 shows the cable connectors on the back of the controller. To install multiple BarcoMed 5MP1HM display controllers in your computer repeat steps 4 – 6.
7. Reconnect the power cord, turn on the power, and boot the system as usual.

Running Multiple BarcoMed Display Controllers in a Single Host

The physical order of the displays may vary when you are running multiple BarcoMed display controllers. This is due to the PC's PCI bus control in the system BIOS, and not the BarcoMed controller. It may become necessary, depending on how your PC's BIOS configures the PCI bus, to switch your BNC display connections to achieve a linear desktop configuration.

Figure 4: The Video Outputs.

VID 1: Connect the Video (green) connector for the first display here.

HS: Connect the Horizontal Sync (Black) connector for the 1st display here.

VS: Connect the Vertical Sync (White) connector for the 1st display here.

DISPLAY INSTALLATION

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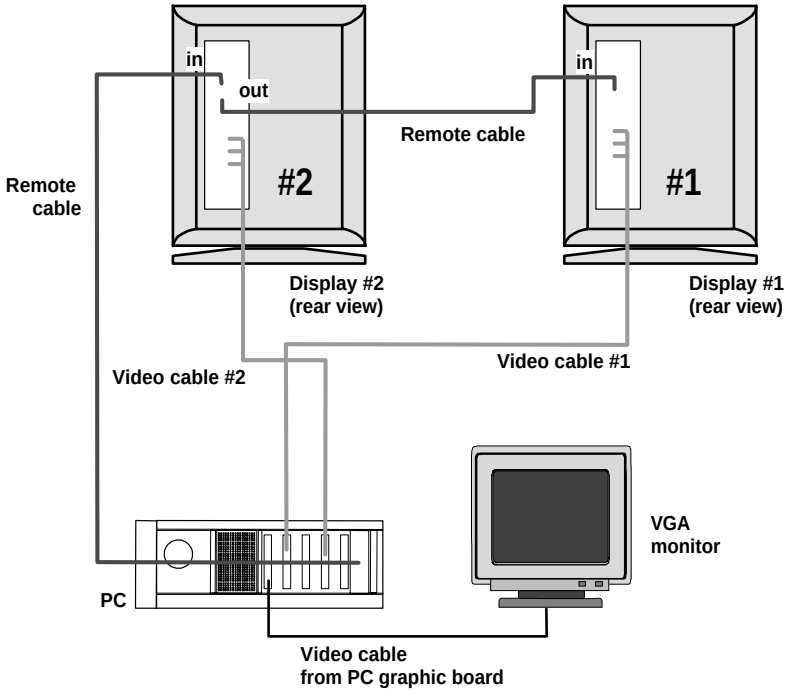
DISPLAY INSTALLATION

Example

An example of a correct set-up is shown in figure 5.

Please take a good look at the figures, and then read the rest of the text very carefully.



BARCO MeDis(r) 5MP1HM dual head (2H) installation

Figure 5

Placing and configuring the displays

1. The last part of this system manual is a copy of the display user manual. Follow the precautions and guidelines from this part.
2. The display(s) from the MeDis system are numbered. E.g., in a quad-head system, the displays are numbered 1 to 4. You can find the number of the display on a label at the rear side.
3. In a multi-head system, the order in which you place the displays is not random: From left to right or from top to bottom in ascending order.
4. The displays' remote addresses are properly set at the factory. The addresses correspond to the display numbers on the rear label: Display #1 has address 1 etc.
   Note: The display address setting can be found in the **Settings** menu in the display's on-screen menus. For more information, please refer to the last part of this manual.

Connection of the video cables

1. The video cables from the MeDis system are numbered. You can find the number on a label on the cable.
   The cable number must correspond to the head (on the display controller) and the display it is connected to: E.g., cable #1 must connect head #1 (on the first display controller) to display #1, cable #2 must connect head #2 (also on the first board) to display #2, etc.
2. Plug in the small coaxial connectors of the video cable into the connectors of the display controller. Plug in the cable connector marked with green plastic, into the board connector marked with a green ring (video). Plug in the cable connector marked with black plastic, into the board connector marked with a black ring (horizontal or composite sync). Plug in the cable connector marked with white plastic, into the board connector marked with a white ring (vertical sync).
3. Plug in the large coaxial connectors of the video cable into the connectors of the display. Plug in the cable connector marked with green plastic, into the display connector marked "Video". Plug in the cable connector marked with black plastic, into the display connector marked "HS/CS". Plug in the cable connector marked with white plastic, into the display connector marked "VS".

Connection of the Remote cables

Note: One of the remote cables is packed inside the MediCal box.

1 The Remote cables that come with MeDis are not numbered. It does not matter which cable you connect to which display, as long as you take the Remote inputs and outputs on the displays into account.

2 Take one of the remote cables from the MeDis system. Plug in its D9 female connector into one of the PC's serial ports (e.g., COM1). If the port has 25 pins, use the D25-to-D9 interface you find in the MediCal software box to connect the remote cable.
Plug the other end, the D9 male connector, into the **Remote In** connector on one of the MGD 521 displays.

3 In case of a multi-board system, take a second Remote cable. Plug the D9 female connector into the **Remote Out** connector of the display you have connected in step 2. Plug the other end of the cable into the **Remote In** connector of another display.

4 Proceed in this way until all displays are daisy-chained through the Remote bus.

Power up the system

Connect the displays and PC to the power supply. Switch on all the devices.

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BARCOMED DRIVER AND SOFTWARE INSTALLATION

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Planning Your Barcomed Windows 2000 Installation

Because of Windows 2000's Plug and Play features, it is very important to carefully plan your BarcoMed Board Hardware and Software installation and install the device drivers in the same sequence that the boards are installed in the PCI slots.

When installing BarcoMed Imaging Boards for the first time in a Windows 2000 System, Windows 2000 Plug and Play Software identifies the BarcoMed boards by the Video Chipset utilized on each boards. The Table below shows the BarcoMed Board, the Chip Set utilized by the board and the driver Windows 2000 Plug and Play selects for each imaging board.

BarcoMed Board Model	Chip Set Utilized	Board Name Selected by Windows 2000 Plug and Play
5MP2 AURA	BarcoView AURA	Video Controller, Video Controller (VGA Compatible) or BarcoMed 5MP2 AURA
5MP2	Imagine Number 9	Metheus 5 Megapixel, dual head display
5MP1HM	BarcoView AURA	Video Controller, Video Controller (VGA Compatible) or BarcoMed 5MP1HM
5MP1H	Imagine Number 9	Metheus 5 Megapixel
4MP2	Imagine Number 9	Metheus 4 Megapixel, dual head display

If you have previously installed drivers for the BarcoMed Imaging Boards in your Windows 2000 System, Windows 2000 should correctly identify the board by their correct BarcoMed name. However, while updating the drivers to a new version or reinstalling the current driver Windows 2000 may identify the BarcoMed Imaging Boards by their Video Chipset.

If you choose to install multiple types of BarcoMed Imaging Boards in your computer it is important to carefully note which PCI slot each board is in and then install the drivers for each type of board based on the PCI slot they are installed in. **If you are using the VGA Capabilities of a BarcoMed Imaging Board it is important to install the driver for this board and set its resolution first.**

Installing the BarcoMed 5MP2 AURA, 5MP2, 5MP1HM, 5MP1H or 4MP2 Windows 2000 Software

SPECIAL NOTE: Prior to installing the BarcoMed drivers and related software you MUST install the BarcoMed Display Controller(s), connect the high resolution display(s) to the card(s), and turn the high resolution display(s) on. Refer to the Hardware Installation section of this manual for instructions on installing the BarcoMed Display Controller(s) and connecting them to the high resolution display(s).

The following software installation instructions presume that Windows 2000 is already installed on your system. If you need to install or reinstall Windows 2000 on your system you must first remove the BarcoMed Display Controller(s) and use a 3rd party VGA card and VGA monitor during the Windows 2000 installation process.

Using the BarcoMed Product Installation Wizard

To install your BarcoMed 5MP2 AURA, 5MP2, 5MP1HM, 5MP1H or 4MP2 Windows 2000 Display Controller Driver and BARCO DPMS Screen Saver for the first time follow the steps below. If you are reinstalling the drivers or installing a new driver release over an existing driver release skip to the step 5:

1. Install the BarcoMed Display Controller(s) into your machine. Please refer to the Hardware Installation Guide that came with your BarcoMed Display Controller(s) for more information.
2. Boot the machine, and log in using an account with administrator privileges.
3. If you are installing the BarcoMed **5MP2 AURA or 5MP1HM** Display Controller, Windows 2000 will automatically launch the “Found New Hardware Wizard”, click **“Cancel”**. Continue to click **“Cancel”** until Windows 2000 stops launching the “Found New Hardware Wizard - Video Controller”.

   If you are installing the BarcoMed **5MP2, 5MP1H** or **4MP2** Display Controller, Windows 2000 will identify the controller as a Metheus Megapixel Display Controller, but will **not** install any driver from its Plug and Play library of device drivers.
4. Windows 2000 may advise you that it has finished installing all the new devices in your system and that you must reboot your system in order for the changes to take effect. If it does, click **“No”**.
5. Insert your BarcoMed Software CD into your computer’s CD drive. The “BarcoMed Product Installation Wizard” should start automatically. If it doesn’t start within 3 minutes, browse the

contents of your BarcoMed Software CD and double click on the file: **"Setup.exe"** to start the wizard.

The BarcoMed Product Installation Wizard will start by inspecting your system to make certain that all of the Windows components it needs are up to date. If it determines that the Microsoft Installer is current, the BarcoMed Product Installation Wizard will display the BarcoMed Product Installation Wizard's welcome screen (see figure 7 on the next page). If it determines that the Microsoft Installer is either out of date or missing, it will display the screen shown in figure 6 below. Click **"OK"** to continue, the wizard will then install a newer version of the Microsoft Installer.

Figure 6

When the BarcoMed Product Installation Wizard advises you that it has successfully installed the new version of the Microsoft Installer, click **"OK"** to continue.

The BarcoMed Product Installation Wizard may prompt you to restart your system. If it does, click **"Yes"** to restart your system.

When your system restarts log in using an account with administrator privileges. If you are installing the BarcoMed **5MP2 AURA or 5MP1HM**, Windows 2000 will again automatically launch the "Found New Hardware Wizard", click **"Cancel**. Continue to click **"Cancel"** until Windows 2000 stops launching the "Found New Hardware Wizard - Video Controller".

6. The BarcoMed Product Installation Wizard's welcome screen will now be displayed (figure 7). By default all the software on the BarcoMed Software CD will be selected. For the initial installation we recommend that you install all of the software. If you do not want to install a particular BarcoMed Software product at this time, deselect it by clearing the checkbox next to it.

   Click **"Install"** to continue or **"Cancel"** to exit the wizard.

Figure 7

Driver Installation

7. Click **"Next"** on the Display Driver Wizard's Welcome Screen to continue or **"Cancel"** to exit the Display Driver Wizard and return to the Software Install Wizard.
8. The Device Selection Screen's dialog box should show only those devices physically installed and supported by the BarcoMed display controller drivers on your BarcoMed Software CD. If there are no BarcoMed devices installed, or if Windows 2000 does not recognized the installed devices, or if the drivers on your BarcoMed Software CD does not support the installed devices, the dialog box will be empty, and program will exit when the user clicks **"Finish"** or **"Cancel"**. Select the device you want to install and then click **"Next"**.

   Note: You can install the driver for only one type of BarcoMed device at a time. If you have multiple types of BarcoMed devices installed in your computer, you will need to rerun the installer to install the drivers for the other devices.
9. If you selected a device with an existing driver, the wizard will compare the existing driver's version against the version of the driver you are installing. If the existing driver's version is newer than the one you are installing, the wizard will warn you that the current driver is newer than the one you are installing (see figure 8 on the next page).

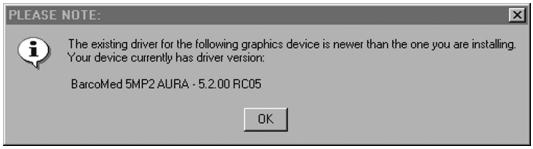

Figure 8

Click **"OK"** to continue. If you don't want to replace the exiting driver, click **"OK"** and then click **"Cancel"**.

10. If you are installing the **BarcoMed 5MP1HM or 5MP1H** skip to step 11. Step 10 applies to the **5MP2 AURA, 5MP2** and **4MP2** only.

    Your selection on the **"Enable DualView"** screen determines if DualView is enabled or not. DualView allows a dual head display controller to display two separate desktops, one for each display instead of a single virtual desktop that spans across both displays. DualView is a feature that is automatically supported by Windows XP. However, BARCO has provided a means for you to enable this functionality while running Windows 2000. Figures 9 and 10 show the difference between running without and with DualView enabled under Windows 2000.

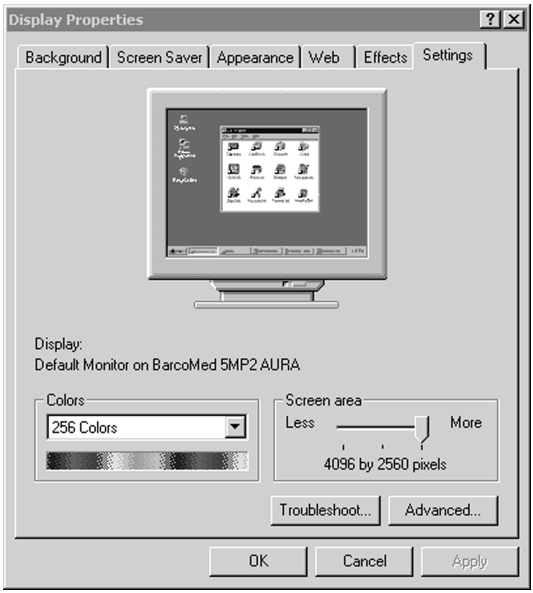

Figure 9: 5MP2 AURA–DualView Disabled

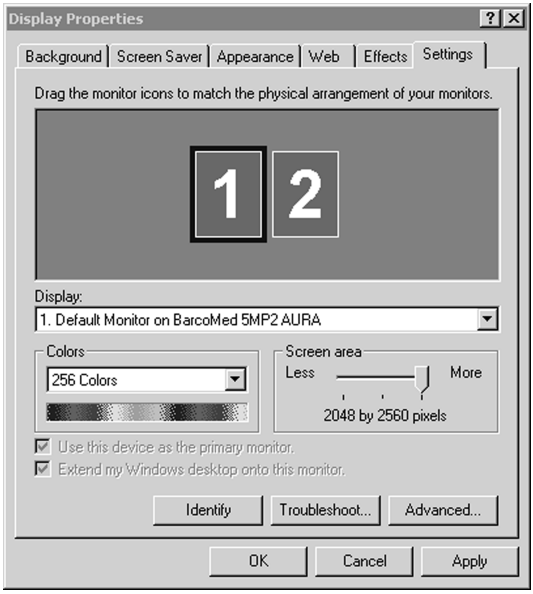

Figure 10: 5MP2 AURA–DualView Enabled

If you wish to enable DualView **"check"** the checkbox next to "Enable the DualView device?", and click **"Next"**. If you do not wish to enable DualView simply click **"Next"** to continue.

11. The **"Device Confirmation"** screen displays the device driver that will be installed. If you want to change your selection, click **"Back"** to return to the Device Selection Screen. Click **"Next"** to begin installing the driver. Click **"Cancel"** to abort the driver installation.

    Special Note: Once you click **"Next",** you cannot cancel the driver installation.

12. Prior to beginning the installation the BarcoMed Driver Install Wizard will warn you that while the driver is being installed your display may flicker. Click **"OK"** to continue.
13. When the screen shown in figure 11 appears, click **"Yes"** to continue. This screen may appear multiple times.

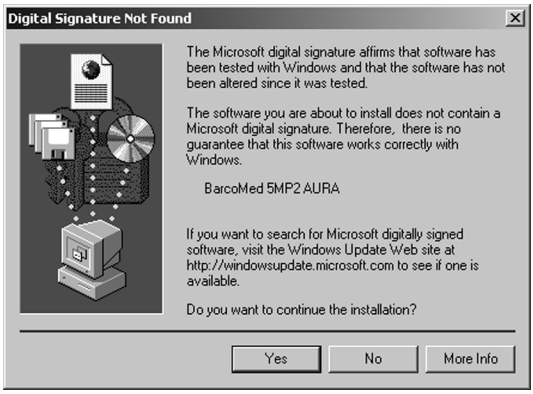

Figure 11

14. When the Wizard tells you that it has successfully installed the selected driver, click **"Finish"**. The wizard will now begin installing the next selected piece of BarcoMed Software. If you are working with the default selections, this will be the BARCO DPMS InstallShield Wizard. Please turn to the section, **"BARCO DPMS Screen Saver Installation"**.

    Note: Clicking **"Cancel"** will also return you to the BarcoMed Product Install Wizard, but will not delete the Barco Display Driver. The wizard will also begin to install the next selected piece of BarcoMed Software.

    If the Wizard failed to successfully install the selected driver, it will warn you (see figure 12 on the next page). Click **"Finish"** to return to the BarcoMed Product Install Wizard.

    The wizard will now begin installing the next selected piece of BarcoMed Software. If you do not want to install the other BarcoMed Software until after you have installed the display driver, click **"Cancel"**. Then click **"Yes"**, then click **"Finish"** and then click **"Back"** and try reinstalling the driver following the steps above or using the steps outlined in "Reinstalling or Updating your BarcoMed Drivers" section found later in this chapter.

    Special Note–5MP2 AURA, 5MP2 or 4MP2 Only: If you installed the BarcoMed 5MP2 AURA, 5MP2 or 4MP2 driver with DualView disabled, Windows 2000 will still show two devices installed for each BarcoMed 5MP2 AURA, 5MP2 or 4MP2 Display Controller installed under "Display Adapters" in the "Device Manager Control Panel". The second device will be disabled. This is normal. Do **NOT** try to enable any of the disabled display adapters. If you wish

to enable DualView, you will need to reinstall the drivers with the “Enable the DualView device?” checkbox checked.

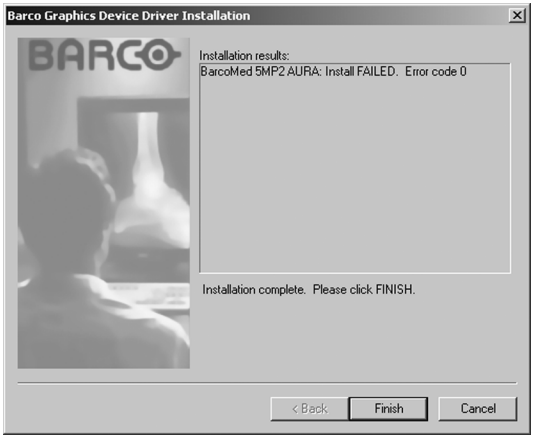

Figure 12

BARCO DPMS Screen Saver Installation

15. Click **“Next”** on the Welcome Screen of the BARCO DPMS InstallShield Wizard to begin the installation. Click **“Cancel”** to cancel the DPMS installation and return to the BarcoMed Product Install Wizard.
16. The “Customer Information” screen will appear (see figure 13 on the next page). The Installer will automatically fill in the blanks using the information entered when Windows was installed on your system. You may change this information if you wish. Click **“Next”** to continue.

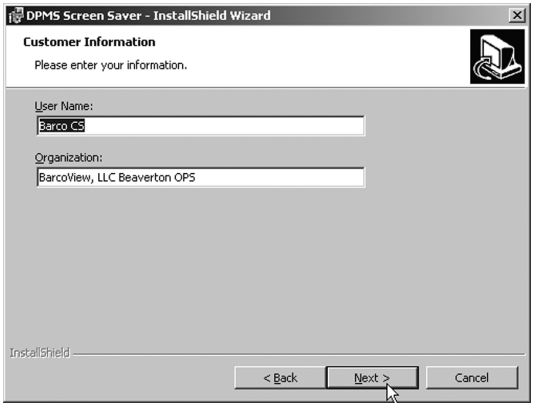

Figure 13

17. The “Setup Type” page will now appear (figure 14). Choose **“Typical”** to install the default schemes with English names. Choose **“Custom”** to install the default schemes with either Dutch or German names. Currently the default schemes are not supported in the Japanese, Korean and Chinese languages. We recommend that the users of these three languages install the English default schemes and then rename and save them into their language in the DPMS configuration screen. Click **“Next”** to continue.

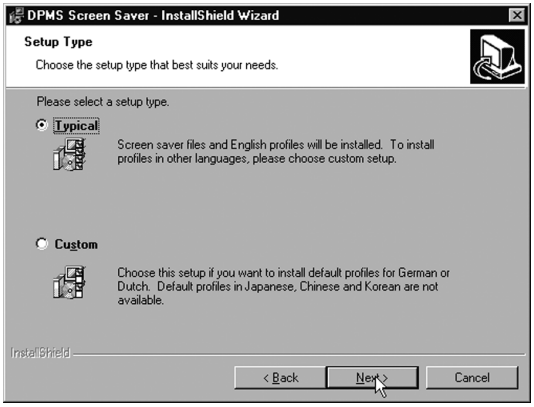

Figure 14

18. The “Ready to Install Program” page will now appear, click **“Install”** to install DPMS or **“Back”** if you wish to change any of your DPMS installation settings.

During installation the wizard will display a progress screen.

19. When the “InstallShield Wizard Completed” page appears, click **“Finish”**.
20. The wizard will now display the screen shown in figure 15 below. If you are finished installing your BarcoMed Software, click **“Finish”** to exit the BarcoMed Product Install Wizard or click **“Back”** to return to the Welcome Screen of the BarcoMed Product Install Wizard to select additional software to install.

Figure 15

When you click **“Finish”,** Windows may warn you that you must restart your computer before the new settings will take effect. If it does, we recommend restarting your computer now.

Setting the Resolution of Your 5MP1HM

1. To set the resolution for your high resolution display(s), right click on the desktop and select **"Properties"**. Select the **"Settings"** tab (see figure 16). Now select the **rectangle** that represents the virtual display of the BarcoMed 5MP1HM Display Controller you are working with.

   SPECIAL NOTE: If you are using the VGA capabilities of your BarcoMed 5MP1HM, the resolution for the virtual display will be set to a VGA resolution of "640 x 480" pixels. If you are NOT using the VGA capabilities of your BarcoMed 5MP1HM, the display may not be enabled yet. To enable the display **check** the **"Extend my Windows desktop onto this monitor"** checkbox. Do not click the **"Apply"** button at this time.

2. Click on the **"Advanced"** Button.
3. Select the **"Adapter"** tab and then click on the **"List All Modes…"** button. Select the desired resolution from the list and click **"OK"**. The chart on the next page contains a partial list of the possible Windows virtual desktop resolutions that might be available for your configuration.

   For example:
   "2048x2560256" at 71Hz.

   NOTE: If you are using dual-headed display controllers, the resolution will be the size of your "virtual desktop."

4. Click **"OK"** on the bottom of the Adapter Control Panel. If the **"OK"** button on the bottom of the Adapter Control Panel is not visible, press the **"Tab"** key once and then **"Enter"** to select **"OK"**.
5. Click **"OK"** in the "Windows will now apply your new desktop settings" dialog box. Your high resolution display(s) should now synchronize and display the Windows desktop.
6. Click **"Yes"** when asked, "Your desktop has been reconfigured. Do you want to keep these settings?"

Repeat steps 1 – 6 for each BarcoMed 5MP1HM Display Controllers installed in your system.

Sample Resolutions		
Controller Configuration	**Display Resolution**	**Virtual Desktop Resolution**
One 5MP2 AURA 2 displays in a single row	2048x2560	4096x2560
One 5MP2 AURA 2 displays in a single column	2048x2560	2048x5120
One 5MP1HM or 5MP1H 1display	2048x2560	2048x2560
Two 4MP2 4 displays in a single row	1728x2304	6912x2304
Two 4MP2 4 displays arranged 2x2	1728x2304	3456x4608

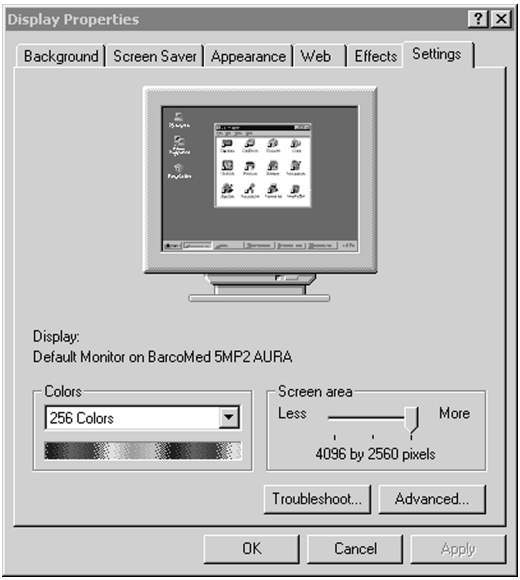

Figure 16: The Windows 2000 Display Properties Control Panel Settings Tab after the drivers have been installed and the resolution set.

Note: The system shown in figure 16 above is a single BarcoMed Display Controller, no 3rd party VGA card configuration, your system may look different.

Reinstalling or Updating your BarcoMed 5MP2 AURA, 5MP2, 5MP1HM, 5MP1H or 4MP2 Driver

To reinstall or update only the BarcoMed Driver, follow the steps described in the section **"Using the BarcoMed Product Installation Wizard"** found at the beginning of this chapter with the following changes.

1. Skip Step 1.
2. In Step 6, clear the checkbox next to the BARCO DPMS.
3. When the driver has finished installing, click **"Finish"**. Then click **"Finish"** again.
4. Reboot the system when prompted and then reset the resolution of your displays if necessary.

Planning Your Barcomed Windows XP Installation

Because of Windows XP's Plug and Play features, it is very important to carefully plan your BarcoMed Board Hardware and Software installation and install the device drivers in the same sequence that the boards are installed in the PCI slots.

When installing BarcoMed 5MP Family Display Controllers for the first time in a Windows XP System, Windows XP Plug and Play Software identifies the BarcoMed boards by the Video Chipset utilized on each board. The table below shows the BarcoMed Display Controller, the Chip Set utilized by the controller and the device Windows XP Plug and Play selects for each Display Controller from its knowledge base. Windows XP will not install any drivers for your BarcoMed 5MP Family Display Controllers unless you are using the VGA capabilities of one of your board, then Windows XP will load the default Microsoft VGA driver for that board.

BarcoMed Board Model	Chip Set Utilized	Board Name Selected by Windows 2000 Plug and Play
5MP2 AURA	BarcoView AURA	Video Controller, Video Controller (VGA Compatible) or BarcoMed 5MP2 AURA
5MP2	Imagine Number 9	Metheus 5 Megapixel, dual head display
5MP1HM	BarcoView AURA	Video Controller, Video Controller (VGA Compatible) or BarcoMed 5MP1HM
5MP1H	Imagine Number 9	Metheus 5 Megapixel
4MP2	Imagine Number 9	Metheus 4 Megapixel, dual head display

If you have previously installed drivers for the BarcoMed Display Controllers in your Windows XP System, Windows XP should identify the board by their correct BarcoMed name. However, while updating the drivers to a new version or reinstalling the current driver Windows XP may identify the BarcoMed Display Controllers by their Video Chipset.

If you choose to install multiple types of BarcoMed Display Controllers in your computer it is important to carefully note which PCI slot each board is in and then install the drivers for each type of board based on the PCI slot they are installed in. **If you are using the VGA capabilities of a BarcoMed Display Controller it is important to install the driver for this board and set its resolution first.**

Installing the BarcoMed 5MP2 AURA, 5MP2, 5MP1HM, 5MP1H or 4MP2 Windows XP Software

SPECIAL NOTE: Prior to installing the BarcoMed drivers you MUST install the BarcoMed Display Controller(s), connect the high resolution display(s) to the controller(s), and turn the high resolution display(s) on. Refer to the Hardware Installation section of this manual for instructions on installing the BarcoMed Display Controller(s) and connecting them to the high resolution display(s).

The following software installation instructions presume that Windows XP is already installed on your system. If you need to install or reinstall Windows XP on your system you must first remove the BarcoMed Display Controller(s) and use a 3rd party VGA controller and VGA monitor during the Windows XP installation process.

Using the BarcoMed Product Installation Wizard

To install your BarcoMed 5MP2 AURA, 5MP2, 5MP1HM, 5MP1H or 4MP2 Windows XP Display Controller Driver and BARCO DPMS Screen Saver for the first time follow the steps below. If you are reinstalling the drivers or installing a new driver release over an existing driver release skip to the step 7 on the next page:

1. Install the BarcoMed Display Controller(s) into your machine. Please refer to the Hardware Installation Guide that came with your BarcoMed Display Controller(s) for more information.
2. Boot the machine and log in using an account with administrative privileges.
3. Windows XP will do a thorough inspection of your system and will announce that it has found new hardware. Please be patient as this may take up to 5 minutes.
4. Close any informational balloons that Windows XP may open in the lower right hand corner of the monitor.
5. If you are installing the BarcoMed **5MP2 AURA** or **5MP1HM** Display Controller, Windows XP will automatically launch the “Found New Hardware Wizard”, click **“Cancel”** to exit the Wizard. Continue to click **“Cancel”** until Windows XP stops launching the “Found New Hardware Wizard - Video Controller”.

   If you are installing the BarcoMed **5MP2, 5MP1H** or **4MP2** Display Controller, Windows XP will identify the controller as a Metheus Megapixel Display Controller, but will **not** install any driver from its Plug and Play library of device drivers.
6. Windows XP may also tell you that it has finished installing new devices and may ask you if you want to restart your computer. If it does, click **“No”**.

7. Insert your BarcoMed Software CD into your computer's CD drive. The "BarcoMed Product Installation Wizard" should start automatically. If it doesn't start within 5 minutes, browse the contents of your BarcoMed Software CD and double click on the file: **"Setup.exe"** to start the wizard.
8. The BarcoMed Product Installation Wizard's Welcome Screen will be displayed (figure 17). By default all the software on the BarcoMed Software CD will be selected. For the initial installation we recommend that you install all of the software. If you do not want to install a particular BarcoMed Software product at this time, deselect it by clearing the checkbox next to it.

   Click **"Install"** to continue or **"Cancel"** to exit the wizard.

Figure 17

Driver Installation

9. Click **"Next"** on the Barco Device Driver Setup Wizard's Welcome Screen to continue or **"Cancel"** to exit the Barco Device Driver Setup Wizard.
10. The Device Selection Screen's dialog box should show only those devices physically installed and supported by the BarcoMed display controller drivers on your BarcoMed Software CD. If there are no BarcoMed devices installed, or if Windows XP does not recognized the installed devices, or if the drivers on your BarcoMed Software CD does not support the installed devices, the dialog box will be empty, and program will exit when the user clicks **"Finish"** or **"Cancel"**. Select the device you want to install and then click **"Next"**.

Note: You can install the driver for only one type of BarcoMed device at a time. If you have multiple types of BarcoMed devices installed in your computer, you will need to rerun the installer to install the drivers for the other devices.

11. If you selected a device with an existing driver, the wizard will compare the existing driver's version against the version of the driver you are installing. If the existing driver's version is newer than the one you are installing, the wizard will warn you that the current driver is newer than the one you are installing (figure 18).

Figure 18

Click **"OK"** to continue. If you don't want to replace the exiting driver, click **"OK"** and then click **"Cancel"**.

12. If you are installing the BarcoMed **5MP1HM or 5MP1H** skip to step 13. Step 12 applies to the **5MP2 AURA, 5MP2** and **4MP2** only.

    Your selection on the **"Enable DualView"** screen determines if DualView is enabled or not. DualView allows a dual head display controller to display two separate desktops, one for each display instead of a single virtual desktop that spans across both displays. DualView is a feature that is automatically supported by Windows XP. Figures 19 and 20 on the next page shows the difference between running without and with DualView enabled under Windows XP.

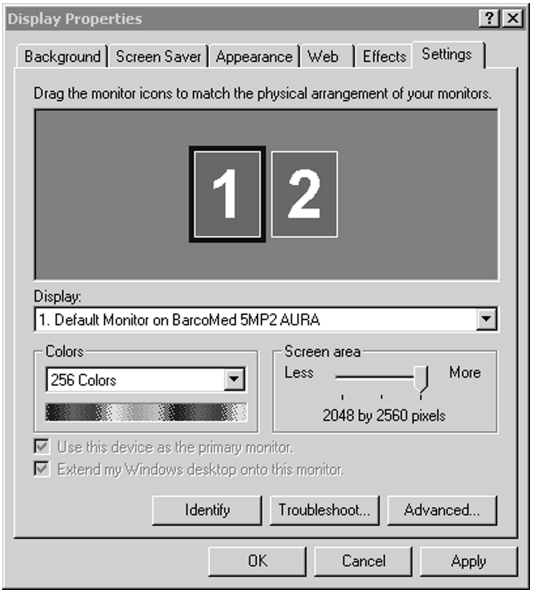

Figure 19: 5MP2 AURA–DualView Enabled

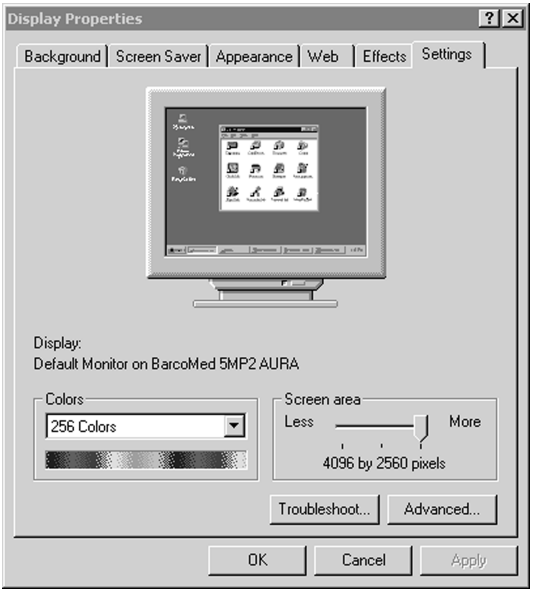

Figure 20: 5MP2 AURA–DualView Disabled

If DualView is not enabled, you will see a single virtual screen in the display properties dialog for both heads of a BarcoMed Display Controller. If DualView is enabled, you will see a two virtual screens in the dialog box on the Settings Tab of the Display Properties Control Panel, one for each head of the BarcoMed Display Controller.

If you wish to enable DualView simply click **"Next"** to continue. If you do not wish to enable DualView **"clear"** the checkbox next to "Enable the DualView device?", and click **"Next"** to continue.

13. The **"Device Confirmation"** screen displays the device driver that will be installed. If you want to change your selection, click **"Back"** to return to the Device Selection Screen. Click **"Next"** to begin installing the driver. Click **"Cancel"** to abort the driver installation.

    Special Note: Once you click **"Next",** you cannot cancel the driver installation.

14. Prior to beginning the installation the BarcoMed Driver Install Wizard will warn you that while the driver is being installed your display may flicker. Click **"OK"** to continue.

15. When the screen shown in figure 27below appears, click **"Continue Anyway"**. This screen may appear multiple times.

Figure 21

17. When the Wizard tells you that it has successfully installed the selected driver, click **"Finish"**. The wizard will now begin installing the next selected piece of BarcoMed Software. If you are working with the default selections, this will be the BARCO DPMS InstallShield Wizard. Please turn to the section, **"BARCO DPMS Screen Saver Installation"**.

Note: Clicking **"Cancel"** will also return you to the BarcoMed Product Install Wizard, but will not delete the Barco Display Driver. The wizard will also begin to install the next selected piece of BarcoMed Software.

If the Wizard failed to successfully install the selected driver, it will warn you (figure 22). Click **"Finish"** to return to the BarcoMed Product Install Wizard.

The wizard will now begin installing the next selected piece of BarcoMed Software. If you do not want to install the other BarcoMed Software until after you have installed the display driver, click **"Cancel"**. Then click **"Yes"**, then click **"Finish"** and then click **"Back"** and try reinstalling the driver following the steps above or using the steps outlined in "Reinstalling or Updating your BarcoMed Drivers" section found later in this chapter.

Figure 22

BARCO DPMS Screen Saver Installation

18. Click **"Next"** on the Welcome Screen of the BARCO DPMS InstallShield Wizard to begin the installation. Click **"Cancel"** to cancel the DPMS installation and return to the BarcoMed Product Install Wizard.
19. The "Customer Information" screen will appear (see figure 23 on the next page). The Installer will automatically fill in the blanks using the information entered when Windows was installed on your system. You may change this information if you wish. Click **"Next"** to continue.

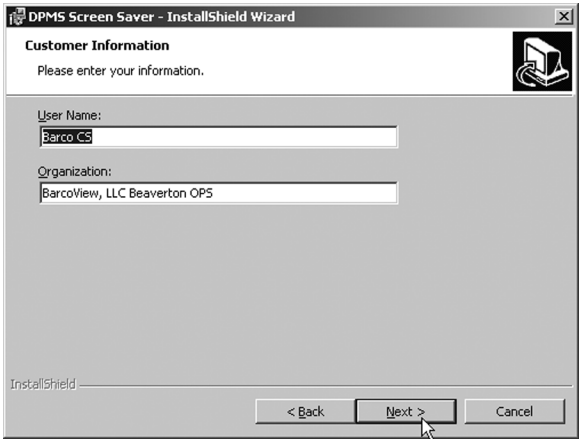

Figure 23

20. The “Setup Type” page will now appear (figure 24). Choose **“Typical”** to install the default schemes with English names. Choose **“Custom”** to install the default schemes with either Dutch or German names. Currently the default schemes are not supported in the Japanese, Korean and Chinese languages. We recommend that the users of these three languages install the English default schemes and then rename and save them into their language in the DPMS configuration screen. Click **“Next”** to continue.

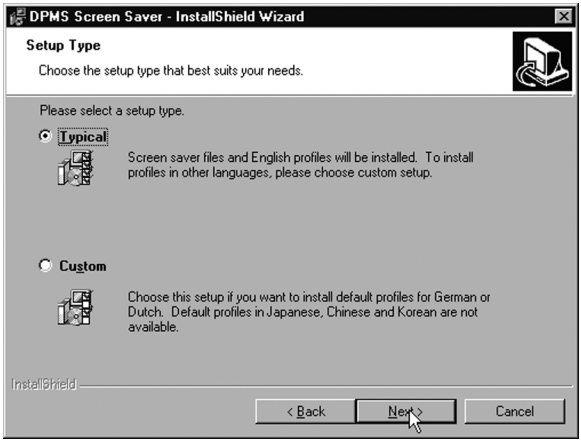

Figure 24

21. The “Ready to Install Program” page will now appear, click **“Install”** to install DPMS or **“Back”** if you wish to change any of your DPMS installation settings.

    During installation the wizard will display a progress screen.

22. When the “InstallShield Wizard Completed” page appears, click **“Finish”**.

    The wizard will now display the screen shown in figure 25 below. If you are finished installing your BarcoMed Software, click **“Finish”** to exit the BarcoMed Product Install Wizard or click **“Back”** to return to the Welcome Screen of the BarcoMed Product Install Wizard to select additional software to install.

Figure 25

When you click **“Finish”,** Windows may warn you that you must restart your computer before the new settings will take effect. If it does, we recommend restarting your computer now.

Setting the Resolution of Your 5MP1HM

Once you have completed the installation of the display driver, you need to set the resolution for each display connected to each controller.

1. To set the resolution for your high resolution display(s), right click on the desktop and select **"Properties"**.

   SPECIAL NOTE: If you are using the VGA capabilities of your BarcoMed 5MP1HM, the resolution for the virtual display will be set to a VGA resolution of "640 x 480" pixels. If you are NOT using the VGA capabilities of your BarcoMed 5MP1HM, the display may not be enabled yet. To enable the display **check** the **"Extend my Windows desktop onto this monitor"** checkbox. Do not click the **"Apply"** button at this time.

2. Select the **"Settings"** tab (see figure 26 on the next page). Now select the **rectangle** that represents the first high resolution display attached to the BarcoMed Display Controller you are working with.

   SPECIAL NOTE: If you are using the VGA capabilities of your BarcoMed Display Controller, the resolution for the first display will still be set to a VGA resolution of "640 x 480" pixels. If you are NOT using the VGA capabilities of your BarcoMed Display Controller, the display may not be enabled yet. To enable the display **check** the **"Extend my Windows desktop onto this monitor"** checkbox. Do not click the **"Apply"** button at this time.
   Note: Since Windows XP will not let you detach the primary display, you may need to temporarily make another display the primary display.

3. For the display which is still attached click on the **"Advanced"** Button.

4. Select the **"Adapter"** tab and then click on the **"List All Modes…"** button. Select the resolution and refresh rate that your high resolution display supports from the dialog box and click **"OK"**.

   Note: In the Adapter box, the Adapter string shows if this display is the First View or the Second View attached to the Display Controller. Please make a note of this, so that you can arrange the displays in the correct order later.

5. Click **"OK"** on the bottom of the Adapter Control Panel. If the **"OK"** button on the bottom of the Adapter Control Panel is not visible, press **"CTRL"+"Enter"** to select **"OK"**.

6. Click **"OK"** in the "Windows will now apply your new desktop settings" dialog box. Your high resolution display(s) should now synchronize and display the Windows desktop.

7. Click **"Yes"** when asked, "Your desktop has been reconfigured. Do you want to keep these settings?"

Repeat steps 2 - 7 for each aditional BarcoMed 5MP1HM display controlled installed in your system.

If you are using a Quad-Head Configuration repeat all of the above steps for the two displays on the second display controller.

Special note: After setting the resolutions in a Quad-Head Configuration you may need to drag the heads into the proper position in the window on the **"Settings**" tab, so that the arrangement in the window on the **"Settings"** tab matches the physical arrangement of your configuration.

Use the BarcoMed Driver Tab of the "Display Properties Control Panel" to verify or change your system settings.

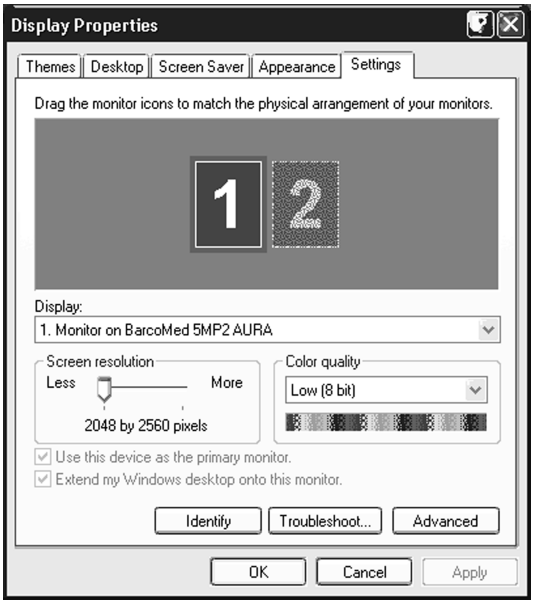

Figure 26: Windows XP Display Properties Settings Tab after the BarcoMed 5MP2 AURA driver has been installed and the resolution set.

Note: The system shown in figure 26 is a dual-head, single BarcoMed 5MP2 AURA Display Controller, no 3rd party VGA controller configuration, your system may look different.

Reinstalling or Updating your BarcoMed 5MP2 AURA, 5MP2, 5MP1HM, 5MP1H or 4MP2 Drivers

To reinstall or update only the BarcoMed Driver, follow the steps described in the section **"Using the BarcoMed Product Installation Wizard"** found at the beginning of this chapter with the following changes.

1. Skip Step 1.
2. In Step 8, clear the checkbox next to the BARCO DPMS.
3. When the driver has finished installing, click **"Finish"**. Then click **"Finish"** again.
4. Reboot the system when prompted and then reset the resolution of your displays if necessary.

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BARCOMED CONTROLLER TOOLS

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BARCOMED DRIVER TAB

Introduction

After the BarcoMed Windows Display Controller Driver is installed, a new Display Properties tab is available for configuring special features of the BarcoMed Display Controller. Please note that you must have logged on to Windows using an account with administrator privileges in order to use the BarcoMed Tabs of the Windows Display Control Panel to change any display settings.

1) Open the “Display Properties Control Panel” by right clicking on the desktop, then select “Properties”..
2) Under Windows NT 4.0, Click on the “BarcoMed Driver” Tab (see figure 27, below).

   Under Windows 2000, click on “Settings” tab. Double click on the rectangle that represents the BarcoMed Display Controller to bring up its property page. Click on the “BarcoMed Driver” tab (see figure 28 on the next page).

   Under Windows XP, click on “Settings” tab. Double click on the rectangle that represents the BarcoMed Display Controller to bring up its property page. Click on the “BarcoMed Driver” tab (see figure 29 on the next page).

Figure 27: BarcoMed Driver Tab under Windows NT 4.0

Figure 28: BarcoMed Driver Tab under Windows 2000

Figure 29: BarcoMed Driver Tab under Windows XP

Status

Displays the current BarcoMed Display Controller, driver, and the currently selected display resolution.

Graphics Board

This displays the current BarcoMed Display Controller.

Driver Version

This displays the current BarcoMed driver version.

Resolution

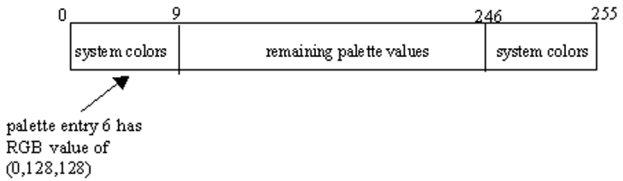
This displays the currently selected display resolution.

Palette Mode

You can choose one of the three following Palette Modes:

UserModifiable Color Palette

This option allows applications to modify the palette contents dynamically. As indicated by the picture below, this mode reserves the first 10 and last 10 entries in the palette for the Windows operating system, but applications can manipulate the middle 236 entries. This is the standard palette mode as configured by Windows.

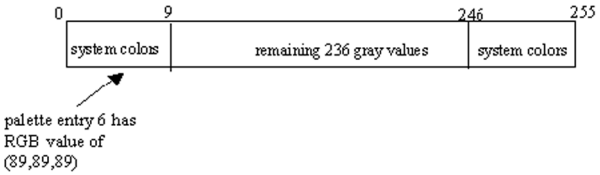


Static Gray Palette including standard system colors

This option sets the palette to be a static set of 256 gray values. Therefore, applications are denied the ability to dynamically change or allocate palette entries. This prevents palette conflicts between applications, which can cause image color values to appear distorted in the background application.

As shown in the next picture, the 20 standard system colors are converted from RGB to gray values. The rest of the 236 entries from

index 10 to 245 contain the missing gray values so that the palette has the full 256 gray values within it.

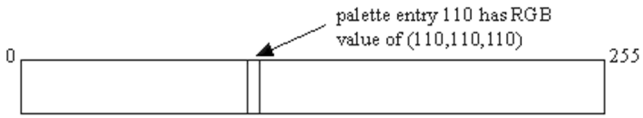


Please note that dithering is not permitted while in this mode. The Enable Dithering check box will be grayed-out, and dithering will be automatically disabled regardless of whether this check box is checked. This complies with the Windows standard interface method. If you are unsure whether or not your application requires this “Static Gray Palette including Standard System Colors” mode, contact your application provider.

Static Gray Palette with NO system colors

This option sets the palette to be a static linear ramp of 256 shades of gray. Therefore, applications are denied the ability to dynamically change or allocate palette entries. This prevents palette conflicts between applications, which can cause image color values to appear distorted in the background application.

As shown in the picture below, each of the 256 entries in the palette has an RGB value of (i, i, i) where i is the index from 0 to 255.



If you wish to use a static gray palette we recommend using the “Static Gray Palette including Standard System Colors” option instead of this one. This is due to the fact that some applications assume that the first and last 10 entries of the palette are the standard system colors. In this palette mode, these entries are made up from entries in the bottom or the top of the gray ramp. Please note that dithering is not permitted while in this mode. The Enable Dithering check box will be grayed-out, and dithering will be automatically disabled regardless of whether this check box is checked. This complies with the Windows standard interface method. If you are unsure whether or not your

application requires this “Static Gray Palette with NO System colors” mode, contact your application provider.

Drawing Modes

You can choose one or both of the following Drawing Modes:

Enable DirectDraw

This option allows the user to enable or disable DirectDraw. DirectDraw is a software interface that provides direct access to display devices while maintaining compatibility with the Windows graphics device interface (GDI). DirectDraw provides a device-independent way for applications to gain access to the hardware features of specific display devices. If you enable DirectDraw, your application will have the choice of using DirectDraw or GDI. If you disable DirectDraw, your application will use GDI instead of DirectDraw. Please note that in any case, your application can always use BarcoMed driver functions (i.e. WinBarco) or other graphics extensions (such as OpenGL).

Enable Dithering

This option allows the user to enable or disable dithering. Dithering is a technique for increasing the perceived range of colors in an image at the cost of spatial resolution. Adjacent pixels are assigned differing color values; when viewed from a distance, these colors seem to blend into a single intermediate color. The technique is similar to the half-toning used in black-and-white publications to achieve shades of gray. Please note that this option is only available when the User Modifiable Palette Mode is selected. This is because dithering is only supported under Windows when the display is palletized. If either the “Static Gray Palette including Standard System Colors” mode or the “Static Gray Palette with NO System colors” mode is selected, the “Enable Dithering” check box will be grayed-out, and dithering will be automatically disabled regardless of whether this check box is checked. This complies with the Windows standard interface method.

Monitor Configuration

This option allows you to select the number of monitors that the current display boards should drive, as well as how the monitors should be positioned. For example, if the current board installation is capable of driving four heads, but you only have three monitors which are placed in a single row, then you can select the “Three monitors –

one row” option from the pull-down list. This would cause the Windows virtual desktop to be resized to fit on the three monitors, and you can move your cursor horizontally from one screen to the other.

If “Custom Configuration” is displayed, it means that the current monitor configuration was set via the registry and it doesn’t agree with any of the configurations that the display control panel supports. Contact BarcoView Medical Imaging Systems for further information.

Languages supported

The BarcoMed Driver Tab supports the following languages:

English (U.S) (default)
Dutch
German
Korean
Japanese
Simplified Chinese
Traditional Chinese

To change between the languages select the correct region via the Regional Settings Control Panel in your machine’s Start > Settings > Control Panel.

BARCOMED HARDWARE TAB

Introduction

The BarcoMed Hardware Tab is used for gathering information about BarcoMed Display Controller(s). For all BarcoMed Display Controller(s) it will display PCI information. In addition for BarcoMed Display Controller(s) based on the AURA video chipset it will also display information about the Firmware installed on the board.

BarcoMed Board Types		
AURA Boards	**Non-AURA Boards**	**BarcoMedHardwareTab Support**
1MP2FH		PCI and Firmware Information
2MP2H		PCI and Firmware Information
2MP1HP		PCI and Firmware Information
2MP2FH		PCI and Firmware Information
3MP2FH		PCI and Firmware Information
5MP1HM		PCI and Firmware Information
5MP2AURA		PCI and Firmware Information
	2MP1	PCI Information Only
	2MP1NT	PCI Information Only
	2MP2	PCI Information Only
	4MP2	PCI Information Only
	5MP1H	PCI Information Only
	5MP2	PCI Information Only

To access the BarcoMed Hardware Tab do the following:

1. Open the “Display Properties Control Panel” by right clicking on the desktop, then select “Properties”.
2. Under Windows NT 4.0, Click on the “BarcoMed Hardware Tab” (see figure 30, below).

   Under Windows 2000 and Windows XP, click on the “Settings” tab. Double click on the rectangle that represents the BarcoMed Display Controller to bring up its property page. Click on the “BarcoMed Hardware Tab” (see figure 31, on the next page).

Figure 30: BarcoMed Hardware Tab under Windows NT 4.0

Figure 31: BarcoMed Hardware Tab under Windows 2000 and Windows XP

Using The BarcoMed Hardware Tab

Device

Displays the current BarcoMed Display Controller, driver, and the currently selected display resolution.

Identify Device: This button is for BarcoView Medical Imaging Systems (MIS) internal use only and is grayed out.

PCI Information

Device ID: Displays the device's PCI Device ID number.

Vendor ID: Displays the device manufacturer's PCI Vendor ID number.

Subsystem ID: Displays the device's PCI Subsystem ID number.

SubsystemVendorID: Displays the device's PCI Subsystem Vendor ID number.

VGA Status: Displays whether the VGA capabilities of the BarcoMed controller are enabled or disabled.

Firmware Information

Product Name: Displays the name of the BarcoMed Display Controller installed in the selected PCI slot.

Serial Number: Displays the serial number of the BarcoMed Display Controller installed in the selected PCI slot.

VGA Bios Version: Displays the VGA Bios version for the BarcoMed Display Controller installed in the selected PCI slot.

Firmware Version: Displays the firmware version for the BarcoMed Display Controller installed in the selected PCI slot.

Hardware Version: Displays the Hardware Version for the BarcoMed Display Controller installed in the selected PCI slot.

"Advanced ..." Button: By clicking on this button, the user can display more information about the BarcoMed Display Controller installed in the selected PCI slot.

"Generate Report" Button: Clicking this button will produce two reports. It will first run the Windows Diagnostics program which will generate a report that is saved to a text file. For Windows XP and Windows 2000, this file will be saved on the c:\ drive and it will be named BarcoMedSystemReport.txt. For Windows NT 4.0, this file will be saved on the desktop and it will have the same name as the machine for which the report is being generated. The other report that is generated contains information about the Barco display adapters installed in the system and will be named BarcoMedDeviceInfo.txt. This report will be saved on the desktop. These files can be emailed to our customer support department when reporting a problem. To locate the closest BarcoView Support office, see the Support section on www.barcomedical.com. If your system is connected to the internet and a web browser is installed you can click on the link at the top of the BarcoMed Hardware Tab to get to our web site.

"Update Device..." Button: Clicking this button will run the BarcoMed Hardware Configuration Wizard. This program allows the user to flash

update the firmware stored in the ROM of the currently selected BarcoMed Display Controller. The BarcoMed Hardware Configuration Wizard is a “wizard style” application that uses dialog boxes to guide the user through the flash update procedure. The user will be prompted to select a firmware update file to use for the update therefore you will need a firmware update file for your specific BarcoMed Display Controller in order to update it’s firmware. This file will be provided by BarcoView MIS if and when a firmware update is required.

Special Note: The BarcoMed Hardware Configuration Wizard is applicable only for AURA-based Display Controller(s).

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BARCO DPMS SCREEN SAVER OVERVIEW

Introduction

The BARCO DPMS (Display Power Management Signaling) Screen Saver allows the user to set power and display saving features for medical displays driven by BarcoMed Display Controllers. At the end of the work day, the display will enter certain DPMS states as requested by the display controller.

The default state for the BARCO DPMS Screen Saver is the Off state. In addition to simply entering the Off state after the work day, the user can specify that the display first go through two other DPMS Screen Saver states before going into Off state. These two other states for the Screen Saver are Stand-By and Suspend. The user can specify how much time should be spent in each state in the “Amount of Time in each DPMS Power State” section.

A valuable feature of the BARCO DPMS Screen Saver is that it will automatically ensure that Cathode Ray Tube (CRT) based displays are warmed up for the start of the work day. All CRT based displays require some warm-up time before they are at full performance.

On CRT based displays, such as the Barco MGD series, a “regular” screen saver can be invoked during user inactivity during the work day. This “regular” screen saver and its settings can be chosen from the “Screen Saver During Work Day” section. We recommend using an all black screen saver, such as the “Barco Blank Screen” saver, for the longest phosphor life.

On Barco CORONIS displays, the I-GUARD will stabilize the image within a few seconds after the display returns to the active state, thus eliminating the need for a warm-up period at the beginning of the work day.

On Liquid Crystal Display (LCD) based displays, such as the Barco CORONIS displays, it is not necessary to invoke a screen saver as there is no CRT phosphor to preserve. However, one can extend the life of the backlight in the LCD display, in addition to realizing great power savings, during period of user inactivity by using DPMS to quickly enter the Off state. We recommend setting the work day to be as short as possible to get the maximum power savings on CORONIS displays.

The BARCO DPMS Screen Saver can also be used when no one is logged on.

BARCO DPMS Screen Saver Options

From the “BARCO DPMS Screen Saver Control Panel” you can change many DPMS screen saver elements simultaneously. The DPMS screen saver elements in each scheme are work schedule, work day screen saver, DPMS settings after work day, and many additional options.

Current Scheme

Lists the three “DEFAULT” schemes which you can use as they are. Or you can modify them to meet your office’s schedule.

Save As

Saves your current BARCO DPMS Screen Saver settings. The name you specify will appear in the Scheme list so you can easily restore these settings later.

Delete

Deletes the scheme that is selected in the Scheme box.

Work Schedule

In this part of the control panel the user may specify the “Begin Work Day” and “End Work Day” times for each work day. If the system is not expected to be used, leave both the “Begin Work Day” and the “End Work Day” times as the same time.

Begin Work Day

The “Begin Work Day” time is the time after which the system is expected to start being used. During the work day, the screen saver selected by the user in the “Screen Saver During Work Day” section is used during user inactivity.

End Work Day

The “End Work Day” time is the time after which the system is not expected to be used any more for that day. After the work day, the display is set to one of the DPMS states (Stand-By, Suspend, or Off) by the display controller during user inactivity.

Screen Saver During Work Day

On CRT based displays, such as the Barco MGD series, a “regular” screen saver can be invoked during user inactivity during the work day. This “regular” screen saver and its settings can be chosen from the “Screen Saver During Work Day” section. We recommend using an all black screen saver, such as the “Barco Blank Screen” saver, for the longest phosphor life.

On LCD based displays, such as the Barco CORONIS displays, it is not necessary to invoke a screen saver as there is no CRT phosphor to preserve. However, one can extend the life of the backlight in the LCD display, in addition to realizing great power savings, during period of user inactivity by quickly entering the Off state. We recommend setting the work day to be as short as possible to get the maximum power savings on CORONIS displays.

Available Savers

Lists the Available Screen Savers.

Settings

Changes settings for the selected screen saver.

DPMS Settings After Work Day

If you have an display controller that supports DPMS calls, then you will be able to set the DPMS Settings for after the work day. Otherwise, a text box will be displayed telling you why DPMS functions are not available.

Amount of Time in each DPMS State

After the work day, the display will be placed into one of the following DPMS Power States: Stand-By, Suspend, or Off. The default setting is for the display to directly go into the Off State and spend no time in the Stand-By or Suspend states. If the user wishes to go into the Stand-By or Suspend states before going into the Off state, select the required amount of time for each state.

If requested, the display will first go into Stand-By state, then into Suspend state, and then into Off state. The properties of DPMS states are listed in the following table:

DPMS State	Power Savings	Monitor Recovery Time
On	None	N/A
Stand-by	Minimal	Short
Suspend	Substantial	Longer
Off	Maximum	Longest

Monitor Settings

Select the amount of time the display requires to warm-up. Since all CRT based displays require some warm-up time before they are at full performance, this ensures that the display is ready for use at the beginning of the work day.

If you have a Barco Medical Display, select “Barco Quick Start.” If a non-Barco display is being used, select the amount of time it takes your display to warm up via the “Monitor Setting” section. Contact your display vendor for this warm-up time.

On Barco CORONIS displays, the I-GUARD will stabilize the image within a few seconds after the display returns to the active state so there is no need for a warm-up time period.

Use As Logon Screen Saver

Check the box to use the BARCO DPMS Screen Saver when no one is logged into the system.

Uncheck the box to use the default screen saver when no one is logged into the system.

Getting started with the BARCO DPMS Screen Saver

The easiest way to get started is to select an existing settings scheme and then modify it with your preferences. Settings schemes are separated into two kinds, DEFAULT (global) and PRIVATE (personal).

Upon installation, three default settings schemes are installed and no private settings schemes are installed.

Default settings schemes are visible to all users of the system. However, they can be modified only by users with administrator

privileges. If a user who does not have administrator privileges tries to save a scheme using an existing default scheme name, an error message is displayed saying “you must have administrator rights to modify a default scheme.” If an administrator saves a scheme using an existing default scheme name, a message is displayed to tell the user that the modification is saved to a default scheme and will be visible to all users. If the administrator saves a scheme using a new name, then the user is asked if the scheme should be saved as a default scheme or a private scheme. Since there is no distinction between how a default scheme and a private scheme is displayed, it is highly recommended that the user uses a different naming convention to distinguish the two (i.e. use “DEFAULT: ...” for default schemes).

Private schemes are personal. They are not shared and are visible only to the users who created them. All users of a system, including those who do not have administrator privileges, can create, modify or delete private schemes. When the delete button is pressed, the user is asked to confirm the delete request.

Using the BARCO DPMS Screen Saver

Using the Barco DPMS Screen Saver is similar to using any other Windows Screen Saver, each user of the system must select the Barco DPMS Screen Saver so that Windows will store the selection in the user’s profile. If a user does not select the BARCO DPMS Screen Saver as his screen saver, the next time he logs on to the system the screen saver selection may be blank.

After selecting the BARCO DPMS Screen Saver the user must then select a settings scheme for the Screen Saver to follow. To set up the BARCO DPMS Screen Saver using one of the three default schemes, please do the following:

1. Open the “Display Properties Control Panel” by right clicking on an empty space of the desktop and selecting “Properties” from the drop down menu; then select the **“Screen Saver”** tab (see figures 32, 33 and 34 on the next two pages).
2. Select the **“Barco DPMS Screen Saver”** in the “Screen Saver” drop down menu if it is not already selected.

Figure 32: Windows NT 4.0 Screen Saver Tab

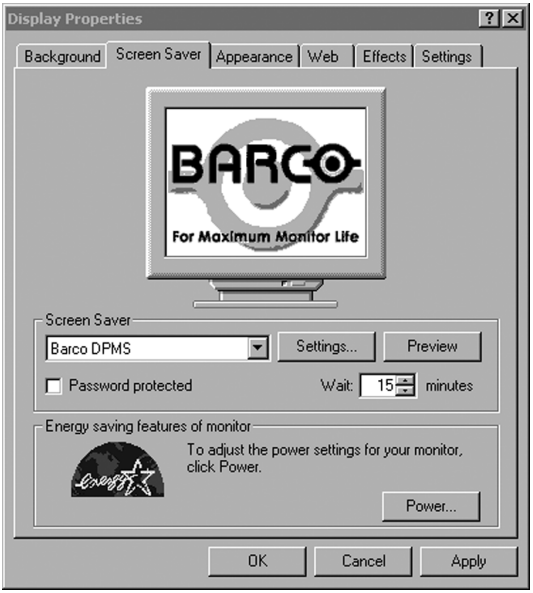

Figure 33: Windows 2000 Screen Saver Tab

Figure 34: Windows XP Screen Saver Tab

3. Click on the **"Settings"** button. The "BARCO DPMS Screen Saver Control Panel" will open (see figure 35).

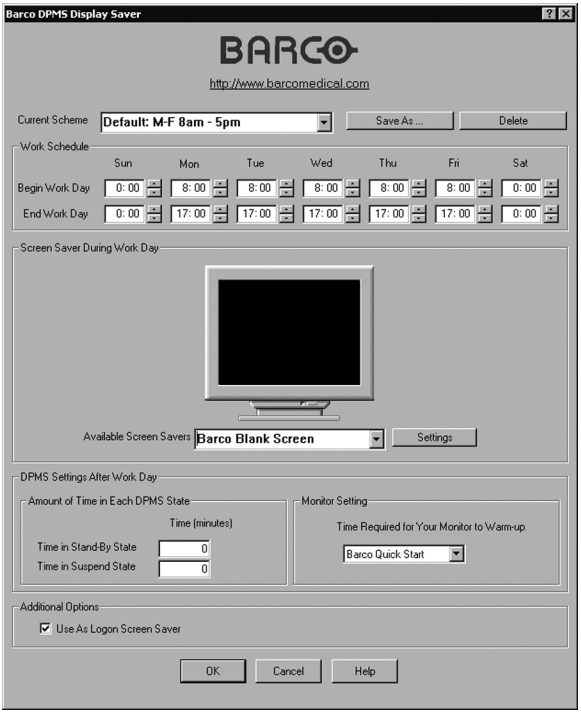

Figure 35: BARCO DPMS Settings Control Panel

4. Use the default schemes by selecting one of the three default schemes. Click **"OK"**. Then Click **"OK"** again.

   Note: If you make any changes to any of the settings of one of the three default schemes, the Current Scheme field will blank and you MUST SAVE your changes by clicking on the **"Save As ..."** button. When you click on the **"Save As ..."** button, the name of the last scheme you used will be automatically displayed, you can then choose to use that scheme name or enter a new name. If you enter a name other than one of the three default scheme names, the program will ask you if you wish to save the scheme as a DEFAULT scheme (see figure 36 on the next page). Click **"Yes"** to save the settings scheme as a DEFAULT scheme, click **"No"** to save the scheme as a PRIVATE scheme. After you have saved the scheme, then click OK and the new scheme will be in effect.

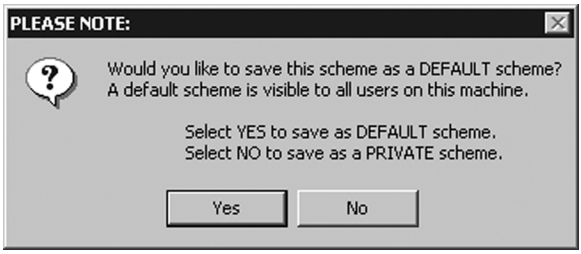

Figure 36

To create a new scheme by modifying one of the three default schemes please do the following.

1. Open the “Display Properties Control Panel” by right clicking on an empty space of the desktop and selecting “Properties” from the drop down menu; then select the **“Screen Saver”** tab.
2. Select the **“BARCO DPMS Screen Saver”** in the “Screen Saver” drop down menu if it is not already selected.
3. Click on the **“Settings”** button. The “BARCO DPMS Screen Saver Control Panel” will open.
4. Select one of the default schemes from the “Current Scheme” drop down menu.
5. Set the Work Schedule by setting the beginning and ending time of your work day for each day of the week.
6. Select the screen saver you wish to use during the work day in the “Screen Saver During Work Day” section.
7. Select the amount of time you wish to spend in the Stand-By and Suspend states after the work day has ended. Please note that after the time specified has elapsed when you are in Stand-By or Suspend, you will automatically go into the Off state.
8. Select the amount of time it takes for your display to warm up. If you have a Barco Medical Display, select **“Barco Quick Start”**. If you are using a non-Barco display, select the amount of time it takes your display to warm up via the “Monitor Setting” section. Contact your display vendor for this warm-up time. On Barco CORONIS displays, the I-GUARD will stabilize the image within a few seconds after the display returns to the active state, thus eliminating the need for a warm-up period at the beginning of the work day.
9. If you wish to use this DPMS screen saver as the screen saver at logon time, check the **“Use As Logon Screen Saver”** box in the “Additional Options” section.

10. Save your preferences by pressing the **"Save As"** button and entering a new profile name in the **"Save Profile Setting"** dialog box.
11. Apply your new scheme by clicking **"OK".**
12. Click **"OK"** again to close the "Display Properties Control Panel".

Installing or Reinstalling BARCO DPMS

To install or reinstall the BARCO DPMS Screen Saver insert the CORONIS Software CD in the appropriate device on your computer and run the BarcoMed Product Install Wizard (please see the section Software Installation for complete instructions).

Special Note: Reinstalling the BARCO DPMS Screen Saver will over write the DPMS configuration settings and you will need to reconfigure the DPMS settings on your system.

Uninstalling BARCO DPMS

To remove the BARCO DPMS Screen Saver from your system insert the CORONIS Software CD in the appropriate device on your computer, run the BarcoMed Product Install Wizard and follow these steps.

1. Select only the DPMS Screen Saver on the BarcoMed Product Install Wizard's welcome screen and click **"Install"**.
2. Click **"Next"** on the Welcome Screen of the BARCO DPMS InstallShield Wizard to begin the installation (figure 37)

Figure 37

3. Select the radio button next to “Remove” on the Program Maintenance screen of the Wizard and click **“Next”** (figure 38).

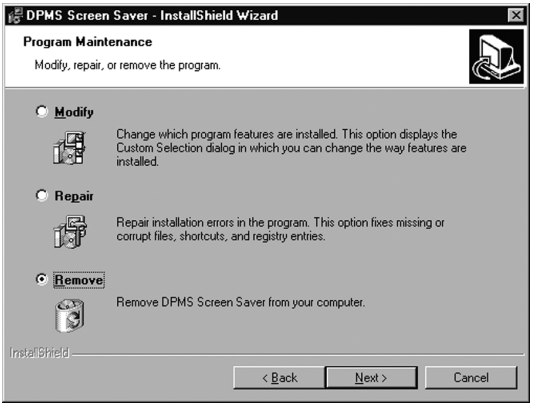

Figure 38

4. Click **“Remove”** on the Remove Program Screen of the Wizard (figure 39).

Figure 39

5. When the Wizard has finished removing the program, click **“Finish”** on the InstallShield Wizard Completed Screen of the Wizard (figure 40).

Figure 40

6. Click **"Quit"** to exit the BarcoMed Product Installation Wizard.

MEDICAL SOFTWARE INSTALLATION AND USAGE

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MEDICAL SOFTWARE INSTALLATION

Install MediCal on the PC. Follow the instructions from the MediCal User Guide.

Important: Do not forget you have to have Administrator privileges to install or uninstall MediCal.

OPTICAL SENSOR CONNECTION

If you are using an X-Rite DTP92 sensor for conformity calibration and consistency check, connect the sensor to one of the display's **Sensor** plugs or to a free PC COM port.

USING MEDICAL

You can now use MediCal to configure the complete configuration and set up the Q/A tasks.

Proceed as follows:

1 Start MediCal. If appropriate, you can connect to MediCal Administrator.
2 Set up the configuration in MediCal by using the **Configuration Setup** wizard.
3 If necessary, align the displays' geometry settings.
4 For all the displays in the system, check if the DPMS setting is turned on. Therefore, right-click on the display icon and select **Properties...** from the drop-down menu. Then click on **Details...** Check if the **Powersave** option is checked. If not, check it. This is necessary to use the DPMS possibilities of the imaging board.
5 For all the displays in the system, define (if necessary) and select a Preset.
6 After selecting the Preset, MediCal starts consistency calibration automatically.
7 Define the Q/A task schedule.
8 Run the due tasks.

Please refer to the MediCal User Guide for more information.

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DISPLAY USER MANUAL

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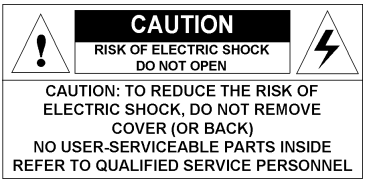
Trademark information

TrueGrey, MediCal, BarcoMed, and MeDis are registered trademarks of BARCO NV.

Windows NT is a registered trademark of Microsoft Corporation.

SAFETY INSTRUCTIONS



• Read the safety and operating instructions before operating the apparatus.
• Retain safety and operating instructions for future reference.
• Adhere to all warnings on the apparatus and in the operating instructions manual.
• Follow all instructions for operation and use.

Regulations

• This apparatus conforms to: IEC601-1, UL2601-1, cUL2601-1, EN 60601-1
• This apparatus is classified as Type B without Applied Part.

Usage in Hazardous locations

• Class I equipment
• Equipment **not** suitable for use in the presence of a **flammable anaesthetic mixture with air** or **with oxygen** or **nitrous oxyde.**

FCC notice

This equipment has been tested and found to comply with the limits of a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Power connection

• Power cord: Utilise a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.
• **Warning:** This apparatus must be earthed!
• Power requirements: connect the apparatus to an AC voltage as indicated at its back. Using a lower voltage, the apparatus will not be able to operate. Using a higher voltage may damage the apparatus.
If you are not sure of the type of power supplied, consult the power company.
• Do not overload wall outlets and extension cords as this may result in fire or electric shock.
• Mains lead protection (U.S.: Power cord): Supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.

Water and moisture

• Never expose the apparatus to rain or moisture.
• Never use the apparatus near water - e.g. near a bathtub, washbasin, swimming pool, kitchen sink, laundry tub or in a wet basement.

Ventilation

• Do not cover or block the ventilation openings in the cover of the set. When installing the apparatus in a cupboard or another closed location, heed the necessary space between the set and the sides of the cupboard.

Installation

• Place the apparatus on a flat, solid and stable surface that can bear the weight of at least 3 monitors. If you use an unstable cart or stand, the set may fall, causing serious injury to a child or adult, and serious damage to the equipment.
More warnings in the Installation chapter.

INTRODUCTION

Overview

Resolution and bandwidths

The BARCO MGD 521 M and MGD 521 MKII displays are ultra-high resolution, grayscale portrait displays. Their outstanding visual performance, combining a 5 MegaPixel resolution with a very high brightness, makes them ideal for diagnostic imaging and many other medical and scientific applications.

The displays are compatible with any AC power system worldwide and automatically synchronise to a wide range of sync frequencies. their high-speed video amplifiers support pixel clocks up to 500 MHz (MGD 521 M: 550 MHz).

The memory system

The internal memory system can contain the adjustments for 16 different scanning formats, the so-called scanning modes. Each scanning format is characterized by its sync signals. The display's internal micro controller continuously samples the connected sync signals and compares them to the scanning modes already stored in the memory. If the connected signal has already been stored, the micro controller adapts the image to the corresponding adjustment values in the memory, and further adjustments are unnecessary.

Image conformity and consistency

Image conformity and consistency are the keywords. In our factory, the MGD 521 displays are perfectly adjusted and calibrated before they are shipped to the customer. Internal circuits, like the TrueGrey® and Automatic White Stability (AWS) systems, ensure display consistency over time.

Conformity with the original image quality is guaranteed by the automatic calibration, which can be done by means of an optical sensor, connected to the Sensor connector on the display. The sensor is not supplied with the display.

Calibration and adjustments

The conformity calibration, as well as the complete adjustment of the display, can be performed by means of the remote, user-friendly MediCal® software package. MediCal is especially developed to

adjust and check BARCO's medical displays.

A lot of adjustments can also be done on the monitor itself, by means of an extensive on-screen menu system, accessible from the rear panel controls.

Power saving system

The MGD 521 displays are equipped with a power saving system. When left idle for a certain time, the computer, connected to the display, will power down the display in several steps. The power saving system can be switched on or off during the installation or adjustment of the display.
This system requires a computer imaging board that supports power saving management.

Versions and options

	MGD 521 M	MGD 521 MKII
P45 phosphors	x	x
P104 phosphors		x
50 Ohm input	x	x
75 Ohm input	x	x

Notes:

- The P45 phosphors produce rather bluish images, whereas the P104 phosphors produce more yellowish images.
- A video input terminated to 50 Ohm requires an imaging board with an impedance of 50 Ohm. A video input terminated to 75 Ohm requires an imaging board with an impedance of 75 Ohm.
- The type of CRT phosphors and the video input termination are indicated on the label at the rear of the display.

Important:

It is absolutely necessary that the impedances of imaging board and display are the same. If not, the image quality will be inferior.

The MediCal software and the X-Rite DTP92 sensor are not delivered with the display.

MediCal can be ordered separately.

About the manuals

This guide is meant for people who want to install and use the MGD 521 displays, as well as people who need to install and adjust the displays. Chapter 4, Adjustments, is meant for this second category only, because it describes actions and procedures that require a technical skill to be performed properly.

The use of the software MediCal is described in the MediCal User's Manual.

INSTALLATION

Precautions

- Keep your original packaging. It is designed for this display and is the ideal protection during transport.
- Do not lift the display all by yourself to avoid injury.
- Avoid reflections in the picture tube to reduce eye strain.
- Place the display on a strong and stable table or desk if used as desktop display.
- Keep the display away from heat sources and provide enough ventilation in case it is built in a rack or console.
- Keep the display away from strong sources of magnetic fields.
- Make sure the display and computer are both switched off before connecting the signals.

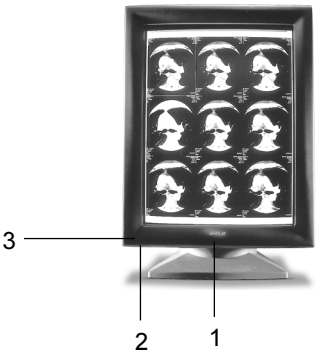
The package contents

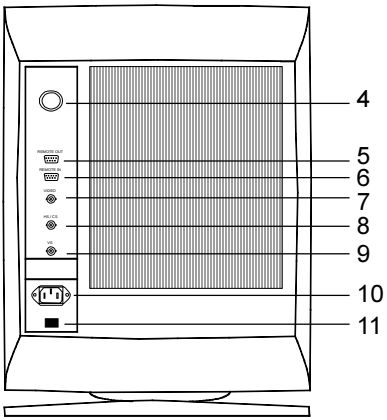
- The display
- The accessory box (in which you found this manual)

Notes:

- The display can be part of a complete **MeDis® system**, consisting of the display itself, an imaging board and software. In that case, the package contains a lot more items. The contents of the package is then described in the manual of the complete system.
- The **ambient light shield** inside the accessory box should always be used during conformity calibration with the X-Rite DTP92 optical sensor.

Controls and connectors





{1} Optical sensor plug

{2} Ambient Light Compensation (ALC) sensor (optional)

{3} Green power LED

{4} Control knob, combination of a push button and a turning knob.
The control knob is used for switching the power on/off, and selecting and performing functions in the OSD (on-screen display) menu.

{5} Remote (RS-232) output

{6} Remote (RS-232) input

{7} Video input

{8} Horizontal / composite sync. input

{9} Vertical sync. input

{10} Power input

{11} Power button

Signal connection

a) Connection of video signals

The connected equipment must comply to all relevant safety demands.
Important: The use of low-quality video cables can distort the video signal and influence diagnosis.

1. Check the **impedance** of the imaging board that produces the video signals you want to connect. It must be 50 or 75 Ohm (just like the input of the display). If not, the quality of the images on the display will be inferior.
2. Connect the video output of the computer's imaging board to the **video and sync inputs** on the display's rear panel. Use a proper video cable. The video cable is not supplied with the display, unless the display comes as part of a complete BARCO MeDis system, that also contains an imaging board.
   The inputs accept the following signals:

• Video with separate horizontal and vertical sync.
  - The video cable has 3 wires.
  - Connect the video signal to the connector Video **{7}**.
  - Connect the horizontal sync signal to the connector HS/CS **{8}**.
  - Connect the vertical sync signal to the connector VS **{9}**.

• Video with external composite sync.
  - The video cable has 2 wires.
  - Connect the video signal to the connector Video **{7}**.
  - Connect the composite sync signal to the connector HS/CS **{8}**.

• Video with internal composite sync (sync on video).
  - The video cable has 1 wire.
  - Connect the video (with sync) signal to the connector Video **{7}**.
  - The vertical sync pulse must be at least 2 lines long.

Notes:

- The video inputs cannot be connected in loop-through (daisy-chain).
- The required video amplitude: 700 mV.
- The required sync. amplitude: 500 mV.

b) Connection of data signals

The display can be controlled remotely by a computer through the serial data bus. A typical example of this, is the **MediCal** software that controls the display. MediCal runs on a PC that is connected through the serial data bus. This PC is not necessarily the same computer as the one that produces the video signals.

Unlike the video signals, it is possible to daisy-chain the serial data bus. This means you can control different displays from one PC.

To connect the data signals:

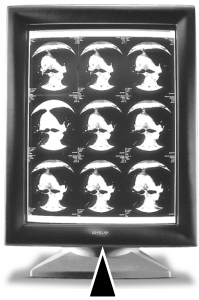
1. Connect one end of the serial data cable to one of the PC's **COM ports**. If the COM port has a 25-pin connector, you will need to use a **D25-to-D9 interface connector**. The cable and the interface connector are both supplied with **MediCal**.
2. Connect the other end of the serial data cable to the **Remote In** connector **{6}** on the display's rear panel.
3. For a daisy-chain application, connect the **Remote Out** connector **{5}** of the first display to the **Remote In** connector **{6}** of the next display.

c) Connection of optical sensor

To calibrate the display, connect the optical sensor to the **Sensor** connector **{1}** at the front.

Notes:

- The display supports the DTP 92 from X-Rite as optical sensor.
- The optical sensor is not supplied by BARCO.
- Calibration can be done by means of MediCal only.
- **Always use the Ambient Light Shield during calibration**.



At the front, the sensor plug is located under the bezel.

d) Connection of power

1. Power cord: Utilize a UL-listed detachable power cord, 3-wire, type SJ or equivalent, 18 AWG min., rated 300 V min., provided with a hospital-grade type plug 5-15P configuration for 120V application, or 6-15P for 240V application.
2. Plug one end of the power cord into the rear of the display (connector LINE **{10}**). Plug the other end into a **grounded** AC power outlet. The display automatically adapts to the voltage. The voltage range is: 100-240 VAC +/- 10%.

Positioning the display

The tilt and swivel base allows you to adjust the height and viewing angle of the display to obtain an optimal viewing comfort.

Important considerations

- The best environment for diagnostic imaging is one with controlled and dimmed ambient light. The human eye's sensitivity depends on the ambient light strength. It is most sensitive to small contrast changes (or subtle image details) at limited ambient light levels.
- The best ambient light level, expressed in Lux, depends on the application. An office illumination typically requires 500 Lux. A dimmed environment, like a softcopy room, requires less than 100 Lux.
- Using your display in a controlled and dimmed environment also extends its lifetime, because the display can operate at limited brightness and contrast. These levels correspond to the calibrated position in most cases.
- A controlled ambient light environment implies the ambient light is as constant as possible. Cover windows to keep out the daylight. Avoid switching the lights and viewing boxes on and off. A consistent environment results in more image consistency and less eye fatigue.
- Avoid reflections in the picture tube. Provide indirect lighting. Don't place the displays in front of or close to a light source like a window or viewing box, although this may be very tempting. As a rule of thumb, keep viewing boxes at least one metre (3 feet) away from the displays.

OPERATION: USER CONTROLS

Important:

The best way to adjust and control the display is by using MediCal, which displays the ideal test patterns for correct adjustment. However, in case you do not dispose of MediCal, you can control and adjust the display by means of the built-in On-Screen Display (OSD).

Switching on / off

Power on/off

Press the Power button **{11}** on the rear panel to switch on the display. **The green LED at the front is off when the display is operating.**

If the display starts up with no image and the green LED **{3}** on, it is in stand-by. This is the case when the display was powered down while in stand-by.

Manual stand-by

To put the display in manual stand-by mode, press the control knob **{4}** shortly. As a result, the green LED is ON continuously.

Note: You cannot switch the display in manual stand-by when the on-screen display (OSD) is visible. In that case, first exit the OSD, and then press the control knob to switch to stand-by mode.

To activate the display from stand-by mode, press the control knob **{4}** again. As a result, the LED is switched off again.

Automatic power saving system (DPMS)

The power saving system, if switched on, can power down the display when you don't use the computer that produces the video and sync. signals for a while. In that way, the system reduces the display's power consumption.

While the display is powered down, the picture tube will be blanked, and **the green LED on the front is on**.

The power saving system is switched off when the display is produced. It can be switched on by a qualified technician.

Note: The power saving system can only work if the connected imaging board supports power management.

For more details, please read Appendix A, "Background information".

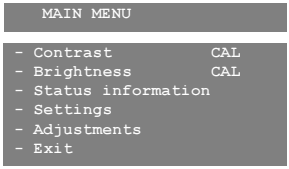
Contrast and brightness control

Contrast and brightness can be controlled through the OSD menus.

To activate the OSD

Turn the control knob **{4}** from left to right or from right to left. As a result, the OSD main menu appears.

Note: The control knob should turn over at least 30 degrees before the OSD becomes visible.



The OSD main menu

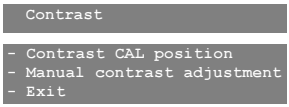
The main menu indicates the current setting for contrast and brightness.

This can be:

- CAL: The calibrated position. This is the preferred setting in a controlled environment.
- ALC: This indicates the Ambient Light Compensation (ALC) is on, and contrast and brightness are controlled automatically, depending on the ambient light. ALC is an option.
- <empty> When the main menu does not specify a setting, contrast or brightness is manually set to a different value than the calibrated position.

To put contrast in calibrated position

1. Turn the control knob to select **Contrast** in the OSD main menu.
2. Press the control knob shortly. The contrast control menu appears.
3. In the contrast control menu, select **Contrast CAL position** and press the control knob shortly.



Contrast control menu

To control contrast manually

1 Turn the control knob to select **Contrast** in the OSD main menu.

2 Press the control knob shortly. The contrast control menu appears.

3 In the contrast control menu, select **Manual contrast adjustment** and press the control knob shortly. The contrast scroll bar appears.

4 Turn the control knob until you have reached the desired contrast.

5 Press the control knob shortly or wait a few seconds to return to the contrast control menu.

6 In the contrast control menu, select **Exit** and press the control knob shortly to return to the main menu. Alternatively, you can just wait a few seconds, and the OSD returns to the previous menu automatically.

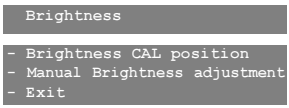
Contrast scroll bar. The short stroke in the bar indicates the calibrated position, the long stroke indicates the current setting.

To put brightness in calibrated position

1 Turn the control knob to select **Brightness** in the OSD main menu.

2 Press the control knob shortly. The brightness control menu appears.

3 In the brightness control menu, select **Brightness CAL position** and press the control knob shortly.



Brightness control menu

To control brightness manually

1 Turn the control knob to select **Brightness** in the OSD main menu.

2 Press the control knob shortly. The brightness control menu appears.

3 In the brightness control menu, select **Manual brightness adjustment** and press the control knob shortly. The brightness scroll bar appears.

Brightness scroll bar. The short stroke in the bar indicates the calibrated position, the long stroke indicates the current setting.

4 Turn the control knob until you have reached the desired brightness.

5 Press the control knob shortly or wait a few seconds to return to the brightness control menu.

6 In the brightness control menu, select **Exit** and press the control knob shortly to return to the main menu. Alternatively, you can just wait a few seconds, and the OSD returns to the previous menu automatically.

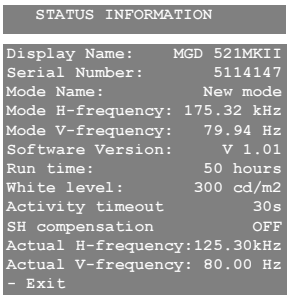
Viewing Status information

You can view the status and actual settings of the display. You cannot change them in the Status Menu. Changing the settings is reserved for trained service staff only.

To view the status information

Turn the control knob to select **Status information** in the OSD main menu.

The Status information menu appears. The only control in the menu is **Exit**.



Example of Status information menu for MGD 521 MKII displays

Explanation of the Status information menu items

Display Name:

This is the display type.

Serial Number:

This is the display's serial number.

Mode Name:

The currently selected scanning mode.

Mode H-frequency, Mode V-frequency:

These are the horizontal and vertical sync frequencies of the currently selected scanning mode. These are the figures stored in the memory.

Software Version:

The internal software version.

Run time:

The total operating time since production, including burn-in time.

White level:

The display's white level or light output after calibration, in calibrated position.

Activity timeout :

This is the time, expressed in seconds, before the display interrupts the data communication with the computer (e.g. during a computer session with MediCal) if the computer does not respond anymore.

SH compensation (optional):

Indicates if Southern Hemisphere compensation is switched on or off. Note: Southern Hemisphere compensation is an option. If the option is not installed in the display, this line does not appear in the menu.

Actual H-frequency, Actual V-frequency:

These are the actual horizontal and vertical sync frequencies of the connected video signal. They are measured constantly by the display.

Other adjustments

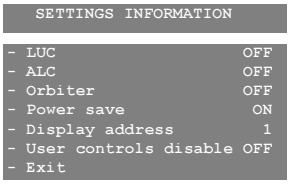
The main menu items **Settings** and **Adjustments** are reserved for trained service staff and are therefore password - protected.

ADVANCED SETTINGS AND ADJUSTMENTS (FOR SERVICE STAFF ONLY)

Important:

The functions and controls described in this chapter can have a serious impact on the performance of the display. They should be touched by trained service staff only!

Settings



The Settings menu

To change the settings

1 Turn the control knob at the rear from left to right or from right to left to activate the On-Screen Display (OSD) main menu.

2 In the main menu, turn the control knob to select **Settings**.

3 Press and hold the control knob **for a few seconds**.
The Settings menu appears. It displays each setting and its current status.
Note: If you press only shortly, the message "Service protected" appears.

4 Turn the control knob to select the setting you want to change.

5 Press the control knob shortly to change the selected setting.

6 For **Display address**, you can change the setting by turning the control knob. Return to the Settings menu by pressing the control knob.
For the other settings, the new status instantly appears in the Settings menu.

Explanation of the Settings menu items

LUC:

LUC is short for Luminance Uniformity Control. When switched on, the internal waveform processor will modulate the gain of the video amplifier so that the luminance is equal all over the screen (within a tolerance of +/- 5%).

The LUC system can be calibrated in the Adjustments menu (see further).

ALC (optional):

ALC is short for Ambient Light Compensation. When this setting is on, the contrast is controlled automatically, depending on the ambient light, measured by the ALC sensor **{2}** in the bezel.

Orbiter:

The Orbiter is an internal circuit that, when switched on, will slightly and slowly move the image to prevent pixel burn-in.

Power save:

This setting can switch the automatic power saving system (see Introduction chapter) on or off.

Display address:

In multi-head systems (multiple displays controlled by one system), each display must have a different address. With this setting you can set the display address from 1 to 16.

User controls disable:

With this setting you can enable or disable the user controls.

When **OFF**, the user controls are not disabled, and the user can activate and use the OSD menus.

When **ON**, the user controls are disabled. After quitting the OSD, the user will no longer be able to activate the OSD.

To activate the OSD again when the user controls are disabled, use the following "code":

1 Turn the control knob 3 times counter-clockwise (seen from the rear).

2 Turn the control knob 3 times clockwise.

3 Turn the control knob 3 times counter-clockwise.

Note: This should be done in quite a short time!

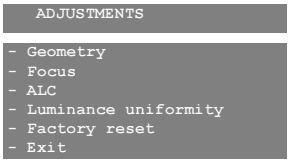
Saving the settings

The settings are automatically saved after changing them.

Adjustments

a) How to make the adjustments

1. Turn the control knob at the rear from left to right or from right to left to activate the On-Screen Display (OSD) main menu.
2. In the main menu, turn the control knob to select **Adjustments**.
3. Press the control knob **for a few seconds**.
   The Adjustments menu appears.
   Note: If you press only shortly, the message "Service protected" appears.
4. Turn the control knob to select the category of adjustments you want to make.
5. Press the control knob shortly to enter the selected category.
6. In the selected menu, select the adjustment you want to make and press the control knob shortly to display the adjustment scroll bar.
7. Turn the control knob to perform the adjustment. After adjusting, press the knob shortly to confirm the adjustment and return to the menu, or press for a longer time to undo the adjustment and return to the menu.
8. Return to the previous menu by pressing the control knob *shortly* or selecting **Exit** when present.

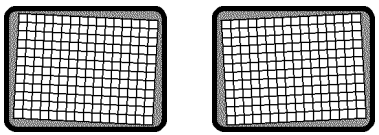


Adjustments menu

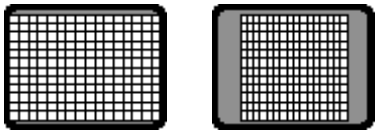
b) Description of the adjustments

Geometry

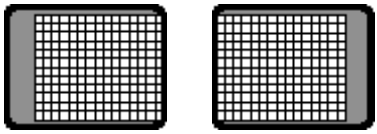
Rotation



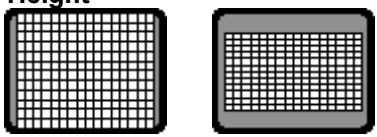
Width



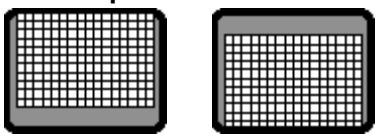
Horizontal position



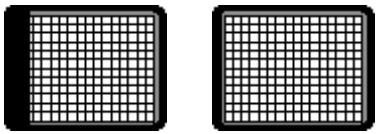
Height



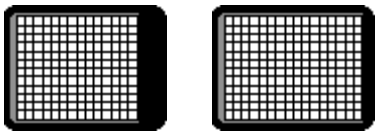
Vertical position



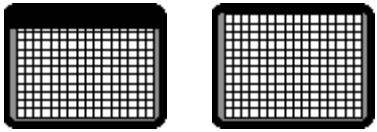
Blanking - Blanking left



Blanking - Blanking right



Blanking - Blanking top



Interlacing - Pre correction

In most cases you do not need to change this adjustment.

You may need to increase this adjustment only when the connected video and sync signal contains an abnormally big number of equalization pulses before the vertical sync (more than 8 lines), resulting in a phase error (geometry distortion) at the bottom of the image.

Interlacing - Post correction

In most cases you do not need to change this adjustment.

You may need to increase this adjustment only when the connected video and sync signal contains an abnormally big number of equalization pulses after the vertical sync (more than 8 lines), resulting in a phase error (geometry distortion) at the top of the image.

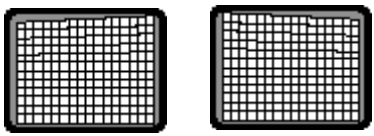
SH Compensation (optional)

If your display is equipped with the Southern Hemisphere option, the on-screen display menu contains additional functions to adjust the image geometry. If the option is not installed in the display, this menu does not appear.

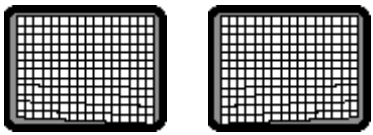
SH Compensation - SH Compensation ON/OFF

For proper geometry adjustment in the Southern Hemisphere, you must switch SH Compensation ON. If not, the SH controls will not function.

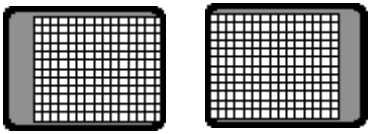
SH Compensation: SH Top



SH Compensation: SH Bottom

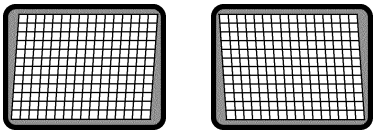


SH Compensation: SH Position

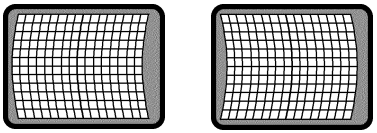


With SH Compensation on, we advise to use the SH Position control instead of the Horizontal Position control in the Geometry menu.

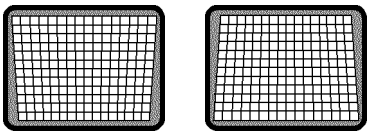
Advanced geometry - Horizontal skewing



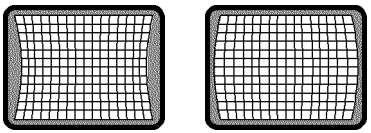
Advanced geometry - Horizontal bowing



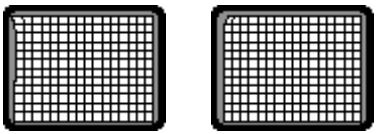
Advanced geometry - Horizontal trapezium



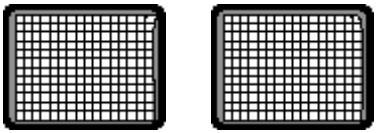
Advanced geometry - Horizontal parabola



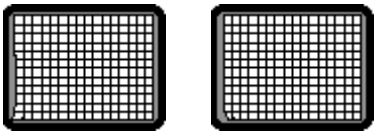
Advanced geometry - Corner top left



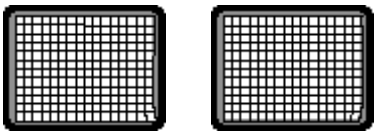
Advanced geometry - Corner top right



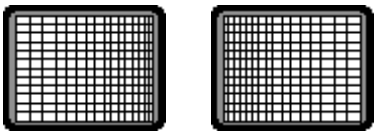
Advanced geometry - Corner bottom left



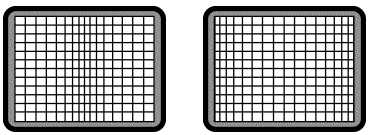
Advanced geometry - Corner bottom right



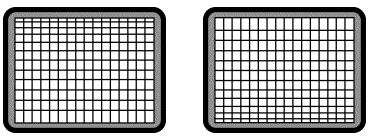
Advanced geometry - Linearity & S-correction - Horizontal linearity



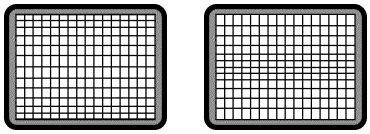
Advanced geometry - Linearity & S-correction - Horizontal S-corr



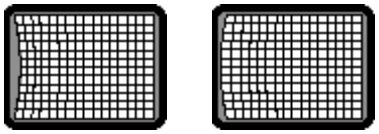
Advanced geometry - Linearity & S-correction - Vertical linearity



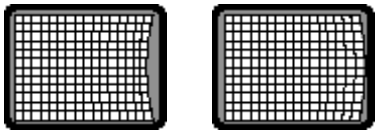
Advanced geometry - Linearity & S-correction - Vertical S-corr



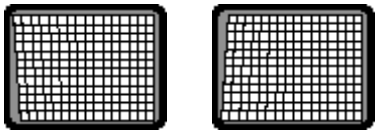
Advanced geometry - Advanced bowing & skewing - Horizontal bowing left



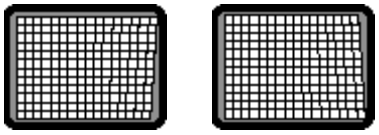
Advanced geometry - Advanced bowing & skewing - Horizontal bowing right



Advanced geometry - Advanced bowing & skewing - Horizontal skewing left



Advanced geometry - Advanced bowing & skewing - Horizontal skewing right



Focus

Static focus

Adjust Static focus to obtain an image as sharp as possible in the center.

Focus zone

You can adjust the focus in 25 independent zones. Turn the control knob to obtain an image as sharp as possible in the selected zone. Press the control knob to switch to the next zone.

ALC (optional)

Ambient Light Compensation (ALC) is an optional system that automatically adapts the display contrast and brightness level to the ambient light in the room. The system has to be adjusted by setting the contrast and brightness in the darkest ambient light conditions the user works, and then repeating this in the brightest conditions.

To adjust the ALC system, proceed as follows:

1. Dim the light in the room to create the darkest ambient light condition the user normally works in.
2. Enter the **Minimum illuminance** menu.
3. Select **Measure ambient light**. The display now stores the ambient light level that corresponds to the darkest condition.
4. Select **Contrast** and set the display contrast to the desired level.
5. Select **Brightness** and set the display brightness to the desired level.
6. **Exit** the Minimum illuminance menu.
7. Increase the light in the room to create the brightest ambient light condition the user normally works in.
8. Enter the **Maximum illuminance** menu.
9. Select **Measure ambient light**. The display now stores the ambient light level that corresponds to the brightest condition.
10. Select **Contrast** and set the display contrast to the desired level.
11. Select **Brightness** and set the display brightness to the desired level.
12. **Exit** the Maximum illuminance menu.

Luminance uniformity

This menu allows you to calibrate the display, including the Luminance Uniformity circuit.

Proceed as follows:

1 Connect the X-Rite DTP92 sensor and apply the black shield (see chapter "Installation").

2 Follow the instructions on the screen.

Factory reset

This function allows you to undo all adjustments you have made since the display left the factory.

Select **Go ahead** to restore the factory settings.

Select **Exit** to return to the previous menu without erasing the adjustments.

c) How to save changes

Proceed as follows:

1 After having made the adjustments, select **Exit** in each appearing menu until the **Save Changes?** message appears.

2 Select **Yes** to save the changes.
Select **No** to exit the OSD menus without saving the changes.

What happens upon saving?

- When the current scanning mode was already stored in the display memory, the scanning mode is updated with the new adjustment values.
- When the scanning mode was not yet stored in the memory, the display will create a new scanning mode in the memory.
  However, when the memory was full, the monitor will display a list of scanning modes in the memory and ask if you wish to overwrite one of them. If you want to store the adjustments you have made, you will have to overwrite one of the scanning modes in memory.

MAINTENANCE

Picture tube

The glass panel of the picture tube is handled with a special coating. Take care not to damage or scratch the coating.

Clean the picture tube with a soft woolen or cotton cloth.

The cloth should be moist, not wet!

Use a watery solution or a mild commercial glass cleaning solution.

Apply (e.g., spray) the solution on the cloth, not on the picture tube.

Cabinet

Clean the cabinet using a recognized cleaning product for medical equipment. The cloth you use must be moist, not wet!

The cabinet has been tested for resistance to the following products: Cidex, Betadine, Alcohol (Isopropyl and Ethyl), Ammonia-based cleaners (Windex) and Aquasonic Gel.

TROUBLESHOOTING

There appears no image on the picture tube, the green LED at the front is out

- Check if the power cord is properly connected to the power outlet and to the display.
- Check if the power button is switched on.

There appears no image, the green LED is on

The display is switched in Stand-by, manually or by the automatic Power saving system.

- Press the control knob at the rear shortly.
- Try to switch on the display by pressing any key on the keyboard of the computer that produces the video and sync. signals for the display.
- Check if both horizontal and vertical sync. signals are connected to the display and to the computer.

On the picture tube appears the message "No Valid Sync Signal"

- Check if both horizontal and vertical sync. signals are connected to the display and to the computer.
- Check if the sync. signals are connected in the proper way (refer to the chapter "Installation").
- Check if both horizontal and vertical sync. frequencies match the display specifications (refer to the chapter "Technical specifications").

For other problems, please consult your technical service department.

APPENDIX A: BACKGROUND INFORMATION

Luminance Uniformity Correction

A characteristic (or limitation) of every picture tube (CRT) is that the luminance decreases towards the edge of the screen surface. The decrease is normally 20 to 30 %.

This is caused by the shape of the picture tube. Inside the CRT, a so-called *electron gun* shoots an electron beam towards the front (the glass panel). Because this panel is rather flat instead of having a spheric shape, the electron beam has to 'travel' a longer distance in the corners than in the center. So the intensity is higher in the center.

This phenomenon is even increased by the irregular distribution of the phosphor and aluminium layer on the glass panel. These tend to be thicker in the center.

BARCO has developed a special system, called Luminance Uniformity Correction (LUC), that solves this problem. The LUC system enhances the light output at the edges of the CRT, so that the luminance there is the same as in the center.

The LUC system is calibrated in the factory. From time to time, it has to be re-calibrated at the customer's site by means of the light sensor you use for normal color calibration. The system can be calibrated and switched on or off by a qualified technician.

Power saving system

The display is equipped with circuits that can handle power saving management. When the system is switched on, it can power down the display in several steps.

The system is controlled by the imaging board or the PC that delivers the video signals. When you are working on the computer, the imaging board delivers both sync signals, and the display is operating normally. When you don't touch the computer keyboard for a certain time, the imaging board only delivers vertical sync. This is sensed by the display's micro controller, that blanks the image on the CRT. This results in a drop of power consumption with about 25 %.

When you leave the computer idle for a longer period, the imaging board now delivers horizontal sync only. As a result, the display's micro controller switches off a number of internal circuits. The power consumption has now dropped with about 42 %.

At last, the imaging board delivers no sync signals at all, and the micro-controller switches off all but one power supplies in the display. Only the micro-controller's own supply keeps on running, resulting in a very low power consumption of 5 W.

If you start using the computer again, the imaging board switches on both sync signals, and the micro-controller switches on the display.

The times after which the different steps of power management must become active, is set in the PC's display properties.

APPENDIX B: TECHNICAL SPECIFICATIONS

Picture tube:
Faceplate transmission: 32%
Faceplate type: ARC panel
Image representation: portrait
Phosphor: P45 (standard) or P104 (option for MGD 521 MKII only)

Light output: (P45 phosphor)
MGD 521: Calibrated: 300 Cd/m2
MGD 521M: Calibrated: 400 Cd/m2
Peak: 600 Cd/m2

Resolution:
Max. adress. pixels: 2048
Max. adress. lines: 2560

Scanning systems
Horizontal scanning:
Multi sync: µ-controller controlled
Minimum frequency: 160 kHz
Maximum frequency: 200 kHz
Minimum blanking : 1.28 µs
Storable scan frequencies: 16
Prealigned scans: 1 or 2
Vertical scanning:
Minimum frequency: 48 Hz
Maximum frequency: 150 Hz
Minimum blanking: 250 µs (after leading edge)

Geometry
Nominal size (4/3 ratio): 300mm x 400mm
Nominal size (4/5 ratio): 304mm x 380mm

Inputs
Video
BNC connectors
Nominal level: 0.7 Vpp
Sync
BNC connectors
Nominal level: 0.5 Vpp
Communication inputs/outputs
RS232 9-pin sub D connector
Baudrate: 9600

Power supply:
Voltage: 100 - 240 V +/- 10%
Frequency: 50/60 Hz
Current: 2.3 A

Environmental
Temperature range (°C):

Storage:	-20/+65
Operation:	0/+45
Within specs:	15/+30

Altitude: storage: 25 000 ft
operational: 10 000 ft
Humidity (relative): 95 % max., non condensing

Weight:

Unpacked	Packed
39.8 kg	58.3 kg

Dimensions packing:
H x W x D: 788mm x 630mm x 780mm

Dimensions monitor (mm):

Height:	558
Width:	400
Depth:	561

Modifications reserved.